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PATENT & TRADEMARK OFFICE

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Re: Appeal to the Board of Patent Appeals and Interferences

In re PATENT application of

Group Art Unit: 2624

Application No. : 09/220,970

Examiner: Chen, W.

Filed: 12/23/98

Date: April 25, 2002

Hon. Asst. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

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Technology Center 2600

Sir:

1 [ ] **NOTICE OF APPEAL**: Applicant hereby appeals to the Board of Patent Appeals and Interferences from the decision (not Advisory Action) dated July 19, 2001 of the Examiner twice/finally rejecting claims

2 [x] **BRIEF** on appeal in this application attached in triplicate.

3 [ ] An **ORAL HEARING** is respectfully requested under Rule 194 (due two months after Examiner's Answer -- unextendable).

4 [ ] Reply Brief is attached in triplicate (due two months after Examiner's Answer -- unextendable).

5 [x] "Small entity" verified statement filed: [ ] herewith. [x] previously.

6 **FEE CALCULATION:**		Large/Small Entity	
If box 1 above is X'd, see box 12 below first and decide:	enter	$	$
If box 2 above is X'd, see box 12 below first and decide:	enter	$	$
If box 3 above is X'd, see box 12 below first and decide:	enter	$	$
If box 4 above is X'd, ...	enter nothing	- 0 - (no fee)	
7. Original due date: May 19, 2002 (Petition made and paid in filed herewith Amendment)			
8. Petition is hereby made to extend the original due date to cover the date this response is filed for which the requisite fee is attac (1 months) (2 months) (3 months) (4 months) (5 months)	$ $ $ $ $		
9. Enter any previous extension fee paid [ ] previously since above original due date (item 7); [ ] with concurrently filed amendment		-	
10. Subtract line 9 from line 8 and enter: Total Extension Fee			
11. TOTAL FEE ATTACHED =			$Already Paid

12. [x] *Fee NOT required if/since paid in prior appeal in which the Board of Patent Appeals and Interferences did not render a decision on the merits.

CHARGE STATEMENT: The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 (missing or insufficient fee only) now or hereafter relative to this application and the resulting Official document under Rule 20, or credit any overpayment, to our Account/Order Nos. 50-0687/ 62-231 for which purpose a duplicate copy of this sheet is attached. **This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal form is filed.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT Application of
Mills

Group Art Unit: 2624

Application Ser. No. 09/220,970

Examiner: W. Chen

Filed: 12/23/98

For: A METHOD AND SYSTEM FOR PATTERN RECOGNITION AND PROCESSING

* * * * *

April 25, 2002

SUPPLEMENTAL APPEAL BRIEF AND
REINSTATEMENT OF APRIL 3, 2001 APPEAL BRIEF

Hon. Asst. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

This is now the second appeal of claims 51-66, 69-95, 98-176, 181-205, 208-231, 233-276 and 278-322 filed in this case, which unfortunately has become more about persecuting Appellant, Dr. Randell L. Mills, than prosecuting his pending application. Despite the review and indication of allowability by six different Examiners, this case was suspiciously transferred to a seventh Examiner, whose lack of qualifications resulted in a specious rejection of Appellant's claims from which a first appeal was taken. [See Appellant's Brief dated April 3, 2001] Rather than respond to that first appeal, the PTO intensified its persecution of Appellant by transferring his application to the eighth and present Examiner. Incredibly, the rejections that followed were even more extreme, relying primarily on prior art technology that Appellant's specification expressly teaches against using. This second appeal followed.

For the many reasons outlined in Appellant's April 3, 2001 Appeal Brief, and for the reasons provided hereinbelow, Appellant respectfully submits that the latest rejections and objections are wholly without merit.

This Appeal Brief is submitted in triplicate as required by 37 C.F.R. § 1.192 (a).

1. Real Party in Interest:

This application is wholly owned by the inventor, Dr. Randell L. Mills, who is the Appellant.

2. Related Appeals and Interferences:

There are no other appeals or interferences known to Appellant or his legal representative that will directly affect or be directly affected by or otherwise have a bearing on the Board's decision in the pending appeal.

3. Status of Claims:

Claims 1-322 are under examinaton. Claims 1-50 have been cancelled. Claims 51-322 are pending in this application.

The rejection of claims 51-322 is appealed. Please refer to the Appendix (2) for a copy of the claims under appeal as amended in the Amendment filed herewith.

An Amendment was filed herewith to reduce the issues for appeal. In that Amendment, claims 79 and 189 were only amended to change the dependency. Claim 127, 237 and 294 were only amended to correct antecedent basis by replacing "the" with "a." Claims 229-236 and 240 were only amended to recite "computer-readable medium" in the preamble to be in conformity with the respective base claims to which they depend. No claims were amended to overcome prior art. All of these amendments were inherent in the original claims and, therefore, the full scope of equivalents under the Doctrine of Equivalents should apply to each claim.

4. Status of any Amendment Filed Subsequent to Final Rejection:

Since no Final Rejection has issued in this case, no amendments have been filed subsequent to a Final Rejection. The claims have been more than twice rejected, which necessitated this appeal.

A second Notice of Appeal was filed on August 27, 2001, along with the appropriate petition for a one-month extension. A fee was not required since this is the second time this application is being appealed. Prosecution was reopened subsequent to the filing of Appellant's appeal brief on April 3, 2001.

5. Explanation of Exhibits:

Exhibit 5: A copy of each claim and how they read on the specification and drawings in compliance with MPEP § 1206 "APPEAL BRIEF CONTENT," (5) as amended in the herewith filed Amendment.

6. Concise Explanation of the Invention:

An embodiment of the present invention is concisely explained in easy to follow flow charts illustrated in Figs. 1-5 and 18-21E of the specification. To the extent further explanation is required, the present invention will be described with reference to these flow charts without being limited thereto. A further concise explanation of the invention is provided in the section below responding to the rejection under 35 U.S.C. § 112, first paragraph, in which support and definitions for numerous claim terms are provided.

MPEP § 1206, "APPEAL BRIEF CONTENT," (5) "Summary of Invention," page 1200-8, states that "it is preferable to read the appealed claims on the specification and any drawing." To facilitate ease of reading, only the independent claims have been discussed in this section with reference to the Figures. A complete copy of each appealed claim and a reading of each claim on the specification is set forth in Exhibit 5. Appellant emphasizes that this reading of the claims in no way limits the claims to any

particular embodiment disclosed in the specification or imposes any other restriction on the scope of the claims.

As recited in claim 51, the invention provides a method for recognizing a pattern in information comprising data, the method comprising:

inputting data;

(Fig. 2, "Data", described at page 8, line 20)

encoding data as parameters of a plurality of Fourier components in Fourier space;

(Fig. 2, processor (22), described at page 8 lines 21-22)

adding at least two of said Fourier components together to form at least one Fourier series in Fourier space;

(Fig. 2 described at page 13 lines 4-6)

sampling at least one of said Fourier series in Fourier space with a filter to form a sampled Fourier series;

(Fig. 2, filter 34, described at page 13 lines 7-10)

modulating said sampled Fourier series in Fourier space with said filter to form a modulated Fourier series;

(Fig. 2, filter 34, described at page 13 lines 7-10)

determining a spectral similarity between said modulated Fourier series and another Fourier series;

(Fig. 2, spectral similarity analyzer 36, described at page 13 lines 10-15)

determining a probability expectation value based on said spectral similarity;

(Fig. 2, probability expectation analyzer 38, described at page 13 lines 14-17)

generating a probability operand based on said probability expectation value;

(Fig. 2, probability operand generator 40, described at page 13 lines 17-20)

selecting a desired value for said probability operand, wherein recognition of a pattern in said information is obtained when said probability operand having said desired value; and

(Fig. 2, described on page 13, lines 20-26, in this disclosed example, the desired probability operand value was selected to be one, but can be any value desired by the user)

outputting a recognized pattern.

(Fig. 2, described on page 13, lines 20-26, when the desired probability operand value is a desired value, a pattern is recognized and can be outputted as recognized. In the particular disclosed example on page 13, the recognized pattern is outputted in a manner such that the Fourier series is combined with said another Fourier series to a provide string of recognized information represented by the Fourier series (which is recited in dependent claim 52). The recognized string can be increased in size as desired by repeating the steps of the method. Recognition is also referred to as "association" or "associated information" in the application.)

Claim 118 provides a method for recognizing a pattern in information, the method comprising:

inputting information;

(Fig. 2, "Data", described at page 8, line 20)

representing the information as a plurality of Fourier series in Fourier space;

(Fig. 2, processor (22), described at page 8 lines 21-22)

forming associations between at least two of the Fourier series by modulating and sampling the Fourier series with filters and by coupling the filtered Fourier series based on a probability distribution, wherein when at least two of the Fourier series have been associated recognition of a pattern in the information is achieved; and

(Fig. 2, described on page 13, lines 5-26)

outputting a recognized pattern in the information.

(Fig. 2, described on page 13, lines 20-26, when the desired probability operand value is a desired value, a pattern is recognized and can be outputted as recognized. In the particular disclosed example on page 13, the recognized pattern is outputted in a manner such that the Fourier series containing the recognized pattern is combined with said another Fourier series to a provide string of recognized information represented by the Fourier series (which is recited in dependent claim 120). The recognized string can be increased in size as desired by repeating the steps of the method.)

An example of claim 127 is disclosed on page 16, line 16 to page 18, line 21. The italicized reference numbers refer to Fig. 4. Claim 127 provides a method for recognizing a pattern in information and establishing an order formatted pattern in information with respect to standard ordered information, the method comprising:

a.) obtaining a string comprising a sum of Fourier series from a memory, said string representing information;

(string memory section 44)

b.) selecting at least two filters from a selected set of filters;

(two filters 48 and 50 from a set of filters 52)

c.) sampling the string with the filters such that each of the filters produces a sampled Fourier series, each Fourier series comprising a subset of the string;

d.) modulating each of the sampled Fourier series in Fourier space with the corresponding selected filter such that each filter produces an order formatted Fourier series;

e.) adding the order formatted Fourier series produced by each filter to form a summed Fourier series in Fourier space;

f.) obtaining an ordered Fourier series from the memory;

(high level memory section 54)

g.) determining a spectral similarity between the summed Fourier series and the ordered Fourier series;

(spectral similarity analyzer 56)

h.) determining a probability expectation value based on the spectral similarity;

(probability expectation value analyzer 58)

i.) generating a probability operand based on the probability expectation value;

(probability operand generator 60)

j.) repeating steps b-i until the probability operand has a desired value, when the probability operand has a desired value a pattern in information has been recognized and an order formatted pattern in the information has been established;

(Processor 42 determines the value of the probability operand. The desired value in the disclosed example on pages 16-18 is one, but can be any value as desired by the user. When the probability operand determined by processor 42 is equal to the desired value a pattern has been recognized.)

k.) storing the summed Fourier series to an intermediate memory;

(intermediate memory section 62)

l.) removing the selected filters from the selected set of filters to form an updated set of filters;

(set of filters 52)

m.) removing the subsets from the string to obtain an updated string;

n.) selecting an updated filter from the updated set of filters;

(selecting updated filter 62 from set of filters 52)

o.) sampling the updated string with the updated filter to form a sampled Fourier series comprising a subset of the string;

p.) modulating the sampled Fourier series in Fourier space with the corresponding selected updated filter to form an updated order formatted Fourier series;

q.) recalling the summed Fourier series from the intermediate memory;

(intermediate memory section 62)

r.) adding the updated order formatted Fourier series to the summed Fourier series from the intermediate memory to form an updated summed Fourier series in Fourier space;

s.) obtaining an updated ordered Fourier series from a high level memory;

(high level memory section 54)

t.) determining a spectral similarity between the updated summed Fourier series and the updated ordered Fourier series;

u.) determining a probability expectation value based on the spectral similarity;

v.) generating a probability operand based on the probability expectation value;

w.) repeating steps n-v until the probability operand has a desired value or all of the updated filters have been selected from the updated set of filters, when the probability operand has a desired value a pattern in information has been recognized an order formatted pattern in the information has been established;

(processor 42)

x.) if all of the updated filters have been selected before the probability operand has a desired value, then clearing the intermediate memory and returning to step b;

y.) if the probability operand has a desired value, then storing the updated summed Fourier series to the intermediate memory;

z.) repeating steps l-y until one of the following set of conditions is satisfied: the updated set of filters is empty, or the remaining subsets of the string of step m.) is nil; and

(processor 42)

aa.) storing the Fourier series in the intermediate memory in the high level memory.
(high level memory section 54)

An example of claim 156 is disclosed at page 7, lines 11-33, and page 23, lines 8-21. The italicized reference numbers refer to Fig. 1. Claim 156 provides a system *(10)* for recognizing a pattern in information comprising data and establishing an order formatted pattern in information, the system comprising:

an input layer *(12)* that receives data representative of physical characteristics or representations of physical characteristics within an input context of the physical characteristics and transforms the data into a Fourier series in Fourier space wherein the input context is encoded in time as delays corresponding to modulation of the Fourier series at corresponding frequencies;

a memory *(20)* comprising a set of initial ordered Fourier series;

an association layer *(14)* that receives a plurality of the Fourier series in Fourier space from the memory, recognizes a pattern in information represented by the Fourier series, forms a string comprising a sum of Fourier series, and stores the string in memory;

a string ordering layer *(16)* that receives the string and at least one ordered Fourier series from the memory, orders the Fourier series contained in the string by establishing an order formatted pattern in information to form an ordered string, and stores the ordered string in memory; and

a predominant configuration layer *(18)* that receives multiple ordered strings from the memory, forms complex ordered strings from the ordered strings, stores the complex ordered strings to the memory, and activates the components of any of the layers of the system to recognize a pattern in information and establish an order formatted pattern in information.

An example of claim 157 is disclosed at page 21, line 9 to page 22, line 33. The italicized reference numbers refer to Fig. 5. Claim 157 provides a method of recognizing a pattern in information, the method comprising:

a.) generating an activation probability parameter based on a prior activation probability parameter and a weighting based on an activation rate of the corresponding component;
(probability parameter generator 66)

b.) storing the activation probability parameter in memory *(20)*;

c.) generating a probability operand based on the activation probability parameter;
(activation probability operand generator 70)

d.) if said probability operand is a desired value, activating any component of one or more of the group consisting of an input layer *(12)*, an association layer *(14)*, a string ordering layer *16)*, and a predominant configuration layer *(18)*, the activation being based on the activation probability parameter, wherein a pattern in information is recognized when said probability operand is said desired value;

e.) repeating steps a-d until a pattern is recognized in the information.

An example of claim 160 is disclosed on page 8, lines 19-23, page 13, lines 1-26, and page 23, lines 8-21, and Fig. 2. Claim 160 provides a computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information comprising data, the computer program comprising instructions which, when executed by a computer, perform the steps of:

encoding data as parameters of a plurality of Fourier components in Fourier space;

(Fig. 2, processor (22), described at page 8 lines 21-22)

adding at least two of said Fourier components together to form at least one Fourier series in Fourier space;

(Fig. 2 described at page 13 lines 4-6)

sampling at least one of said Fourier series in Fourier space with a filter to form a sampled Fourier series;

(Fig. 2, filter 34, described at page 13 lines 7-10)

modulating said sampled Fourier series in Fourier space with said filter to form a modulated Fourier series;

(Fig. 2, filter 34, described at page 13 lines 7-10)

determining a spectral similarity between said modulated Fourier series and another Fourier series;

(Fig. 2, spectral similarity analyzer 36, described at page 13 lines 10-15)

determining a probability expectation value based on said spectral similarity;

(Fig. 2, probability expectation analyzer 38, described at page 13 lines 14-17)

generating a probability operand based on said probability expectation value; and

(Fig. 2, probability operand generator 40, described at page 13 lines 17-20)

selecting a desired value for said probability operand, wherein recognition of a pattern in said information is obtained when said probability operand having said desired value.

(Fig. 2, described on page 13, lines 20-26, in this disclosed example, the desired probability operand value was selected to be one, but can be any value desired by the user. When the desired probability operand value is a desired value, a pattern is recognized. In the particular disclosed example on page 13, the Fourier series containing the recognized pattern is combined with said another Fourier series to a provide string of recognized information represented by the Fourier series (which is recited in dependent claim 162). The recognized string can be increased in size as desired by repeating the steps of the method. Recognition is also referred to as "association" or "associated information" in the application.)

An example of claim 228 is disclosed on page 8, lines 21-22, page 13, lines 5-26, and page 23, lines 8-21. Claim 228 provides a computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information, the computer program comprising instructions which, when executed by a computer, perform the steps of:

representing the information as a plurality of Fourier series in Fourier space; and

(Fig. 2, processor (22), described at page 8 lines 21-22)

forming associations between at least two of the Fourier series by modulating and sampling the Fourier series with filters and by coupling the filtered Fourier series based on a probability distribution, wherein when at least two of the Fourier series have been associated recognition of a pattern in the information is achieved.

(Fig. 2, described on page 13, lines 5-26, when the desired probability operand value is a desired value, a pattern is recognized. In the particular disclosed example on page 13 the Fourier series containing the recognized pattern is combined with said another Fourier series to a provide string of recognized information represented by the Fourier series (which is recited in dependent claim 230). The recognized string can be increased in size as desired by repeating the steps of the method.)

An example of claim 237 is disclosed on page 16, line 16 to page 18, line 21, and page 23, lines 8-21. The italicized reference numbers refer to Fig. 4. Claim 237 provides a computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information and establishing an order formatted pattern in information with respect to standard ordered information, the computer program comprising instructions which, when executed by a computer, perform the steps of:

a.) obtaining a string comprising a sum of Fourier series from a memory, said string representing information;

(string memory section 44)

b.) selecting at least two filters from a selected set of filters;

(two filters 48 and 50 from a set of filters 52)

c.) sampling the string with the filters such that each of the filters produces a sampled Fourier series, each Fourier series comprising a subset of the string;

d.) modulating each of the sampled Fourier series in Fourier space with the corresponding selected filter such that each filter produces an order formatted Fourier series;

e.) adding the order formatted Fourier series produced by each filter to form a summed Fourier series in Fourier space;

f.) obtaining an ordered Fourier series from the memory;

(high level memory section 54)

g.) determining a spectral similarity between the summed Fourier series and the ordered Fourier series;

(spectral similarity analyzer 56)

h.) determining a probability expectation value based on the spectral similarity;

(probability expectation value analyzer 58)

i.) generating a probability operand based on the probability expectation value;

(probability operand generator 60)

j.) repeating steps b-i until the probability operand has a desired value, when the probability operand has a desired value a pattern in information has been recognized and an order formatted pattern in the information has been established;

(Processor 42 determines the value of the probability operand. The desired value in the disclosed example on pages 16-18 is one, but can be any value as desired by the user. When the probability operand determined by processor 42 is equal to the desired value a pattern has been recognized.)

k.) storing the summed Fourier series to an intermediate memory;

(intermediate memory section 62)

l.) removing the selected filters from the selected set of filters to form an updated set of filters;

(set of filters 52)

m.) removing the subsets from the string to obtain an updated string;

n.) selecting an updated filter from the updated set of filters;

(*selecting updated filter 62 from set of filters 52)*

o.) sampling the updated string with the updated filter to form a sampled Fourier series comprising a subset of the string;

p.) modulating the sampled Fourier series in Fourier space with the corresponding selected updated filter to form an updated order formatted Fourier series;

q.) recalling the summed Fourier series from the intermediate memory;

(intermediate memory section 62)

r.) adding the updated order formatted Fourier series to the summed Fourier series from the intermediate memory to form an updated summed Fourier series in Fourier space;

s.) obtaining an updated ordered Fourier series from a high level memory;

(high level memory section 54)

t.) determining a spectral similarity between the updated summed Fourier series and the updated ordered Fourier series;

u.) determining a probability expectation value based on the spectral similarity;

v.) generating a probability operand based on the probability expectation value;

w.) repeating steps n-v until the probability operand has a desired value or all of the updated filters have been selected from the updated set of filters, when the probability operand has a desired value a pattern in information has been recognized an order formatted pattern in the information has been established;

(processor 42)

x.) if all of the updated filters have been selected before the probability operand has a desired value, then clearing the intermediate memory and returning to step b;

y.) if the probability operand has a desired value, then storing the updated summed Fourier series to the intermediate memory;

z.) repeating steps l-y until one of the following set of conditions is satisfied: the updated set of filters is empty, or the remaining subsets of the string of step m.) is nil; and

(processor 42)

aa.) storing the Fourier series in the intermediate memory in the high level memory.

(high level memory section 54)

An example of claim 266 is disclosed on page 21, line 9 to page 22, line 33 and page 23, lines 8-21, referring to Fig. 5. Claim 266 provides a computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information and establishing an order formatted pattern in information, the computer program comprising instructions which, when executed by a computer, perform the steps of:

a.) recording ordered strings comprising Fourier series to a high level memory, said Fourier series representing information;

(high level memory section 54)

b.) forming association between Fourier series of the ordered strings to form complex strings and recognizing a pattern in information;

(association layer 14)

c.) ordering the Fourier series of the complex strings to form complex ordered strings representing recognized information and establishing an order formatted pattern in information, and

(string ordering layer 16)

d.) storing the complex ordered strings to the high level memory.

(complex ordered string section 72, high level memory section 54)

An example of claim 267 is disclosed on page 21, line 9 to page 22, line 33 and page 23, lines 8-21, referring to Fig. 5. Claim 267 provides a computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information comprising data and forming a predominant configuration, the computer program comprising instructions which, when executed by a computer, perform the steps of:

a.) generating an activation probability parameter based on a prior activation probability parameter and a weighting based on an activation rate of the corresponding component;

(activation probability parameter generator 66)

b.) storing the activation probability parameter in memory;

(memory 20)

c.) generating a probability operand based on the activation probability parameter;

(activation probability operand generator 70)

d.) if said probability operand is a desired value, activating any component of one or more of the group consisting of an input layer, an association layer, a string ordering layer, and a predominant configuration layer, the activation being based on the activation probability parameter, wherein recognition of a pattern in information is achieved when said probability operand is said desired value, and

(input layer 12, association layer 14, string ordering layer 16, predominant configuration layer 18, while the desired value is one in the disclosed example, any suitable value can be selected by the user)

e.) repeating steps a-d to form a predominate configuration.

An example of claim 270 is disclosed at page 7, lines 11-33, and page 23, lines 8-21. The italicized reference numbers refer to Fig. 1. Claim 270 provides a computer program product for recognizing a pattern in information for use in a computer including a central processing unit and a memory, the memory maintaining a set of initial ordered Fourier series, the computer program product comprising:

a computer readable medium;

program code means embodied in the computer readable medium, the program code means comprising:

means for receiving data representative of physical characteristics or representations of physical characteristics within an input context of the physical characteristics and transforming the data into a Fourier series in Fourier space wherein the input context is encoded in time as delays corresponding to modulation of the Fourier series at corresponding frequencies;

(input layer 12)

means for receiving a plurality of the Fourier series in Fourier space including at least one ordered Fourier series from the memory, forming a string comprising a sum of the Fourier series and storing the string in memory;

(association layer 14, memory 20)

means for retrieving the string from memory, ordering the Fourier series contained in the string to form an ordered string and storing the ordered string in memory; and

(string ordering layer 16)

means for retrieving multiple ordered strings from the memory, forming complex ordered strings from the ordered strings and storing the complex ordered strings to the memory.

(predominant configuration layer 18)

An example of claim 271 is disclosed at page 1, line 32 to page 2, line 14 and page 21, line 9 to page 23, line 36. The italicized reference numbers refer to Fig. 5. Claim 271 provides a method of recognizing a pattern in information comprising data and establishing an order formatted pattern in information, the method comprising:

encoding inputted data as a plurality of Fourier components in Fourier Space and form a plurality of Fourier series from said Fourier components, said Fourier series representing information comprising data and input context;

associating said plurality of Fourier series with each other according to spectral similarities between said plurality of Fourier series to form a string, said string being a sum of associated plurality of Fourier series;

ordering said plurality of Fourier series within said string based on relative degree of association of order formatted subsets of said string with relevant aspects of a standard ordered string;

(predominant configuration layer 18 receives ordered strings from the high level memory section 54 and form more complex ordered strings)

assigning an activation probability parameter to each of said plurality of Fourier components and to each of said plurality of Fourier series to produce a predominant configuration string, generating a probability operand based on said activation probability parameter, said probability operand determining whether an activation of any one of said plurality of Fourier component and said plurality of Fourier series is to cause an activation of an associated another of said plurality of Fourier components and said plurality of Fourier series from said ordered string; and

(the predominant configuration layer 18 includes an activation probability parameter generator 66)

storing said predominant configuration string in a memory, thereby a pattern in newly inputted information can be recognized.

(memory 20)

An example of claim 281 is disclosed at page 7, lines 11-33 and page 23, lines 8-26. The italicized reference numbers refer to Fig. 1. Claim 281 provides a system *(10)* for recognizing a pattern in information comprising data, the method comprising:

an input layer *(12)* operable to receive said data, and to encode said received data as parameters of a plurality of Fourier series in Fourier space, said plurality of Fourier series including input context of said data;

a memory *(20)* comprising a set of initial ordered Fourier series;

an association layer *(14)* operable to add associated Fourier series together to form a string;

an ordering layer *(16)* operable to order said string based on relative degree of association of order formatted subsets of said string with relevant aspects of characteristics with respect to at least one of said initial ordered Fourier series to form an ordered string;

a predominant configuration layer *(18)* for receiving said ordered string and for assigning an activation probability parameter to each of said plurality of Fourier series to produce a predominant configuration string, generating a probability operand based on said activation probability parameter, said probability operand determining whether an activation of any one of said plurality of Fourier components and said plurality of Fourier series is to cause an activation of an associated another one of said plurality of Fourier components or Fourier series; and

a memory *(20)* adapted to store said predominant configuration string, said predominant configuration string allowing a determination of a relative association of a newly inputted information to said inputted information already processed, thereby recognition of a pattern in said information can be recognized.

An example of claim 285 is disclosed at page 1, line 32 to page 2, line 14 and page 21, line 9 to page 23, line 36. The italicized reference numbers refer to Fig. 5. Claim 285 provides a method of recognizing a pattern in information comprising data, the method comprising:

providing an input layer operable to receive data;

providing an association layer operable to add associated portions of said data together to form a string;

providing an ordering layer operable to order said string based on a relative degree of association of order formatted subsets of said string with relevant aspects of information of a standard string to form an ordered string;

(predominant configuration layer 18 receives ordered strings from the high level memory section 54 and forms more complex ordered strings)

providing a predominant configuration layer operable to receive a plurality of ordered strings to form a complex ordered string therefrom;

assigning an activation probability parameter to each of said input layer, said association layer, said ordering layer and said predominant configuration layer, said activation probability parameter being determined based on a historical value of said activation probability parameter and an activation rate of respective ones of said input layer, said association layer, said ordering layer and said predominant configuration layer;

(the predominant configuration layer 18 includes an activation probability parameter generator 66)

generating a probability operand based on the activation probability parameter; and

(activation probability operand generator 70)

activating one or more of said input layer, said association layer, said ordering layer, said predominant configuration, said ordering layer, said predominant configuration layer, and said association layer if said probability operand has a desired

value, whereby a pattern in said information is recognized according to a historical associative pattern in said data.

(input layer 12, association layer 14, string ordering layer 16, predominant configuration layer 18, while the desired value is one in the disclosed example, any suitable value can be selected by the user)

An example of claim 290 is disclosed on page 2, lines 15-33, page 8, line-25, page 13, lines1-26, and page 23, lines 8-26, referring to Fig. 2. Claim 290 provides a computer readable medium having stored thereon a computer program to implement a method of recognizing a pattern in information comprising data, said computer program comprising a plurality of codes for executing the steps of:

encoding said data as parameters of a plurality of Fourier components in Fourier space;

(Fourier transform processor 22, described on page 8, line 20)

adding said plurality of Fourier components together to form a plurality of Fourier series in Fourier space, said plurality of Fourier series representing inputted information;

(page 13, lines 4-6)

sampling at least one of said plurality of Fourier series in Fourier space with a filter to form a sampled Fourier series;

(filter 34, described at page 13, lines 7-10)

modulating said sampled Fourier series in Fourier space with said filter to form a modulated Fourier series;

(filter 34, described at page 13, lines 7-10)

determining a spectral similarity between said modulated Fourier series and another one of said plurality of Fourier series;

(spectral similarity analyzer 36, described at page 13, lines 10-15)

determining a probability expectation value based on said spectral similarity;

(probability expectation analyzer 38, described at page 13, lines 14-17)

generating a probability operand based on said probability expectation value; and

(probability operand generator 40, described at page 13, lines 17-20)

adding said modulated Fourier series and said another Fourier series, if said probability operand has a desired value, to form a string of Fourier series in Fourier space, said string representing an association between Fourier series to thereby allow recognition of a pattern in the information.

(described on page 13, lines 20-26, when the desired probability operand value is a desired value, one in this example, a pattern is recognized and can be outputted as recognized. In the particular disclosed example on page 13, the recognized pattern is outputted in a manner such that the Fourier series is combined with said another Fourier series to a provide string of recognized information represented by the Fourier. The recognized string can be increased in size as desired by repeating the steps of the method.)

An example of claim 294 is disclosed on page 16, line 16 to page 18, line 21, and page 23, lines 8-26. The italicized reference numbers refer to Fig. 4. Claim 294 provides a method for recognizing a pattern in information and establishing an order formatted pattern in information with respect to standard ordered information, the method comprising:

a.) obtaining a string comprising a sum of Fourier series from a memory, said string representing information;

(string memory section 44)

b.) selecting at least two filters from a selected set of filters;

(two filters 48 and 50 from a set of filters 52)

c.) sampling the string with the filters such that each of the filters produces a sampled Fourier series, each Fourier series comprising a subset of the string;

d.) modulating each of the sampled Fourier series in Fourier space with the corresponding selected filter such that each filter produces an order formatted Fourier series;

e.) adding the order formatted Fourier series produced by each filter to form a summed Fourier series in Fourier space;

f.) obtaining an ordered Fourier series from the memory;

(high level memory section 54)

g.) determining a spectral similarity between the summed Fourier series and the ordered Fourier series;

(spectral similarity analyzer 56)

h.) determining a probability expectation value based on the spectral similarity;

(probability expectation value analyzer 58)

i.) generating a probability operand based on the probability expectation value;

(probability operand generator 60)

j.) repeating steps b-i until the probability operand has a desired value, when the probability operand has a desired value a pattern in information has been recognized and an order formatted pattern in the information has been established;

(Processor 42 determines the value of the probability operand. The desired value in the disclosed example on pages 16-18 is one, but can be any value as desired by the user. When the probability operand determined by processor 42 is equal to the desired value a pattern has been recognized.)

k.) storing the summed Fourier series to an intermediate memory;

(intermediate memory section 62)

l.) removing the selected filters from the selected set of filters to form an updated set of filters;

(set of filters 52)

m.) removing the subsets from the string to obtain an updated string;

n.) selecting an updated filter from the updated set of filters;

(selecting updated filter 62 from set of filters 52)

o.) sampling the updated string with the updated filter to form a sampled Fourier series comprising a subset of the string;

p.) modulating the sampled Fourier series in Fourier space with the corresponding selected updated filter to form an updated order formatted Fourier series;

q.) recalling the summed Fourier series from the intermediate memory;

(intermediate memory section 62)

r.) adding the updated order formatted Fourier series to the summed Fourier series from the intermediate memory to form an updated summed Fourier series in Fourier space;

s.) obtaining an updated ordered Fourier series from a high level memory;

(high level memory section 54)

t.) determining a spectral similarity between the updated summed Fourier series and the updated ordered Fourier series;

u.) determining a probability expectation value based on the spectral similarity;

v.) generating a probability operand based on the probability expectation value;

w.) repeating steps n-v until the probability operand has a desired value or all of the updated filters have been selected from the updated set of filters, when the probability operand has a desired value a pattern in information has been recognized an order formatted pattern in the information has been established;

(processor 42)

x.) if all of the updated filters have been selected before the probability operand has a desired value, then clearing the intermediate memory and returning to step b;

y.) if the probability operand has a desired value, then storing the updated summed Fourier series to the intermediate memory;

z.) repeating steps l-y until one of the following set of conditions is satisfied: the updated set of filters is empty, or the remaining subsets of the string of step m.) is nil; and

(processor 42)

aa.) storing the Fourier series in the intermediate memory in the high level memory, said updated summed Fourier series representing said plurality of Fourier series in said strings ordered according to a plurality of associations between the information of the plurality of order formatted subset Fourier series and the at least one ordered Fourier series from high level memory.

(high level memory section 54)

An example of claim 299 is disclosed on page 1, line 32 to page 2, line 14, and page 21, line 9 to page 23, line 26, referring to Fig. 5. Claim 299 provides a computer readable medium having stored thereon a computer program to implement a method of recognizing a pattern in information comprising data and establishing an order formatted pattern in the information, said computer program comprising a plurality of codes for executing the steps of:

providing an input layer operable to receive data;

(input layer 12)

providing an association layer operable to add associated portions of said data together to form a string;

(association layer 14)

providing an ordering layer operable to order said string based on a relative degree of association of order formatted subsets of said string with relevant aspects of information of a standard string to form an ordered;

(string ordering layer 16)

providing a predominant configuration layer operable to receive a plurality of ordered strings to form a complex ordered string therefrom;

(predominant configuration layer 18)

assigning an activation probability parameter to each of said input layer, said association layer, said ordering layer and said predominant configuration layer, said activation probability parameter being determined based on a historical value of said activation probability parameter and an activation rate of respective ones of said input layer, said association layer, said ordering layer and said predominant configuration layer;

generating a probability operand based on the activation probability parameter; and

(activation probability parameter generator 66)

activating one or more of said input layer, said association layer, said ordering layer, said predominant configuration, said ordering layer, said predominant configuration layer, and said association layer if said probability operand has a desired value, whereby a pattern in said information is recognized according to a historical associative pattern in said data.

(input layer 12, association layer 14, string ordering layer 16, predominant configuration layer 18, while the desired value is one in the disclosed example, any suitable value can be selected by the user)

An example of claim 304 is disclosed on page 1, line 29 to page 4, line 30, and page 21, line 9 to page 23, line 26, referring to Fig. 5. Claim 304 provides a computer program product for use in a system for recognizing a pattern in information comprising data, said computer program product comprising:

a computer readable medium having stored thereon program code means, said program code means comprising:

means for receiving data, and to encode said received data as parameters of a plurality of Fourier series in Fourier space, said plurality of Fourier series including input context of said data;

(input layer 12)

means for associating Fourier series together to form a string;

(association layer 14)

means for ordering said string based on a relative degree of association of order formatted subsets of said string with relevant aspects of information of a standard string to form an ordered string; and

(string ordering layer 16)

means for forming a complex ordered string from a plurality of ordered strings, said complex ordered string representing a historical association and order of processed and stored information to thereby allow recognition of a pattern in information.

(predominant configuration layer 18)

An example of claim 307 is disclosed on page 6, line 25 to page 23, line 26. Claim 307 provides a data structure in a memory for access by a computer program for processing information, said data structure allowing an efficient recognition of a pattern in newly presented information comprising data and input context representing characteristic in relational association with information stored in said memory, said data structure comprising:

a plurality of transduced data objects, each of said plurality of transduced data objects providing an input data object representative of characteristics received from a transducer acting on a signal provided by the characteristics encoded as a Fourier series in Fourier space;

(input layer 12)

a plurality of memory data objects stored in memory registers corresponding to the input data objects;

(register 26 of memory 20)

a plurality of association data objects, each of said plurality of association data objects being a sum of associated ones of said plurality of memory data objects or transduced data objects;

(association layer 14)

a plurality of order formatted data objects, each of said plurality of order formatted data objects being one of said plurality of association data objects arranged in a hierarchically order of relative degree of association of relevant aspects of said information with respect to a standard plurality of association data objects;

(string ordering layer 16)

a plurality of activation probability objects, each of said plurality of activation probability objects being assigned to respective one of said plurality of transduced data objects, input data objects, memory data objects, said plurality of association data objects and said plurality of order formatted data objects;

(activation probability generator 66)

a plurality of probability operands being assigned to respective plurality of transduced data objects, input data objects, memory data objects, said plurality of association data objects and said plurality of order formatted data objects, each based on said activation probability objects;

(activation probability operand generator 70)

wherein each of said plurality of transduced data objects, said input data objects, said memory data objects, said plurality of association data objects and said plurality of order formatted data objects is activated when one of said plurality of probability operands has a desired value; and

(predominant configuration layer 18 discussed on page 22, lines 8-33)

wherein a value of each of said plurality of activation probability objects being determined based on historical values and frequency of activation of said respective

one of said plurality of transduced data objects, input data objects, memory data objects, said plurality of association data objects and said plurality of order formatted data objects to thereby allow recognition of characteristics of said newly presented information based on historical relational and associational pattern in said information stored in said memory.

An example of claim 313 is described on page 2, lines 15-33, page 8, line 19 to page 16, line 15, and page 22, line 34 to page 23, lines 26. Claim 313 provides a data structure in a memory for access by a computer program for efficient recognition of a pattern in information comprising data stored in the memory, the data structure comprising:

a plurality of transduced data objects, each of said plurality of transduced data objects providing an input data object representative of characteristics received from a respective one of a plurality of transducers acting on a signal provided by characteristics encoded as a Fourier series in Fourier space, wherein said input data objects allows associations among and relational pattern of said input data objects by spectral analysis to achieve recognition of a pattern in information, while preserving input context of said input signal including an identity of said respective one of said plurality of transducers.

(input layer 12, Fourier transform processor 22, spectral similarity analyzer 36)

7. Issues:

I. Whether the drawings fully comply with 37 CFR 1.83(a) and MPEP § 608.2(d)

II. Whether the specification complies with the patent laws and rules

III. Whether claims 61-64, 71-86, 98-113, 123-126, 138-145, 148-155, 171-174, 181-196, 208-223, 233-236, 248-255 and 258-265 fully comply with 35 U.S.C. § 112, second paragraph

IV. Whether claims 127-155, 237-265, 294-298 and 307-322 fully comply with 35 U.S.C. § 101

V. Whether claims 157 and 266-267 are patentable under 35 U.S.C. § 102(e) over U.S. Patent No. 6,058,206 (Kortge)

VI. Whether claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309 and 312-320 are patentable under 35 U.S.C. § 102(e) over U.S. patent No. 6,173,275 (Caid)

VII. Whether claims 158-159 and 268-269 are patentable under 35 U.S.C. § 103(a) over Kortge as applied to claims 157 and 267 above, and further in view of U.S. patent No. 5,724,487 (Streit)

VIII. Whether claims 279-280, 289, 292-293, 302-303 and 321-322 are patentable under 35 U.S.C. § 103 over Caid as applied to claims 271, 281, 291, 299 and 320 above, and further in view of Streit.

IX. Whether claims 156, 270, 273, 275 and 284 are patentable under 35 U.S.C. § 103 over Caid in view of Dickhaus et. al., "Classifying Biosignals with Wavelet Networks," IEEE Engineering in Medicine and Biology, September/October, 1996, pages 103-111 (hereinafter "Dickhaus").

X. Whether claims 51-54, 57-60 and 118-120 are patentable under 35 U.S.C. § 103 over H. Greenspan, et. al., "Texture Analysis via Unsupervised and Supervised Learning," IJCNN-91-Seattle International Joint Conference on Neural Networks, 1991, Vol. 1, pages 639-644 (hereinafter "Greenspan")

XI. Whether claims 55, 87-90, 114, 117, 160-165, 167-170, 197-200, 224 and 227-230 are patentable under 35 U.S.C. § 103 over Greenspan in view of Kortge.

XII. Whether claim 56 is patentable under 35 U.S.C. § 103 over Greenspan as applied to claim 51 above, and further in view of Streit.

XIII. Whether claims 115-116, 166 and 225-226 are patentable under 35 U.S.C. § 103 over Greenspan and Kortge as applied to claims 114, 160 and 224 above, and further in view of Streit.

XIV. Whether claims 65-66, 69-70, 91, 94-95 and 21 are patentable under 35 U.S.C. § 103 over Greenspan in view of Dickhaus

XV. Whether claims 175-176, 201, 203-205 and 231 are patentable under 35 U.S.C. § 103 over Greenspan and Kortge in view of Dickhaus

XVI. Whether claims 92 and 93 are patentable under 35 U.S.C. § 103 over Greenspan and Dickhaus, and further in view of U.S. patent No. 5,337,264 (Levien).

XVII. Whether claim 202 is patentable under 35 U.S.C. § 103 over Greenspan, Kortge and Dickhaus, and further in view of Levien.

8. Grouping of Claims:

For purposes of the rejection of claims 61-64, 71-86, 98-113, 123-126, 138-145, 148-155, 171-174, 181-196, 208-223, 233-236, 248-255 and 258-265 under 35 U.S.C. § 112, second paragraph, in this Appeal only, all these claims stand or fall together.

For purposes of the rejection of claims 127-155, 237-265, 294-298 and 307-322 under 35 U.S.C. § 101, in this Appeal only: claims 127-155 and 294-298 stand or fall together and do not stand or fall with any other claims; claims 237-265 stand or fall together and do not stand or fall with any other claims; and claims 307-322 stand or fall together and do not stand or fall with any other claims.

For purposes of the rejection of claims 157 and 266-267 under 35 U.S.C. § 102(e) over U.S. Patent No. 6,058,206 (Kortge), in this Appeal only: claim 266 does not stand or fall with any other claim; and claims 157 and 267 stand or fall together.

For purposes of the rejection of claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309 and 312-320 under 35 U.S.C. § 102(e) over U.S. patent No. 6,173,275 (Caid), in this Appeal only: claims 271-272, 274, 276, 278, 281-283, 287, 290-298, 304-309 and 312-320 stand or fall together for certain arguments as separately argued in Section VIII; claims 271-272, 274, 276, 278, 281-283, 285, 290-291, 299-301 and 304-306 stand or fall together for certain arguments as separately

argued in Section VIII; claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309 and 312-320 stand or fall together for certain arguments as separately argued in Section VIII; claims 271, 272, 274, 276, 278, 281-283, and 307-320 stand or fall together for certain arguments as separately argued in Section VIII; claims 271, 272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, and 304-306 stand or fall together for certain arguments as separately argued in Section VIII; claims 271, 272, 274, 278, 281-283 and 307-320 stand or fall together for certain arguments as separately argued in Section VIII; and claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309 and 312-320 stand or fall together for certain arguments as separately argued in Section VIII.

For purposes of the rejection of claims 158-159 and 268-269 under 35 U.S.C. § 103(a) over Kortge as applied to claims 157 and 267 above, and further in view of U.S. patent No. 5,724,487 (Streit), in this Appeal only: all claims 158-159 and 268-269 stand or fall together.

For purposes of the rejection of claims 279-280, 289, 292-293, 302-303 and 321-322 under 35 U.S.C. § 103 over Caid as applied to claims 271, 281, 291, 299 and 320 above, and further in view of Streit, in this Appeal only: claims 279-280, 289, 292-293, and 302-303 stand or fall together for certain arguments as separately argued in Section X; and claims 279-280, 289, 292-293, 302-303 and 321-322 stand or fall together for certain arguments as separately argued in Section X.

For purposes of the rejection of claims 156, 270, 273, 275 and 284 under 35 U.S.C. § 103 over Caid in view of Dickhaus et al., "Classifying Biosignals with Wavelet Networks," IEEE Engineering in Medicine and Biology, September/October, 1996, pages 103-111 (hereinafter "Dickhaus"), in this Appeal only: all clams 156, 270, 273, 275 and 284 stand or fall together.

For purposes of the rejection of claims 51-54, 57-60 and 118-120 under 35 U.S.C. § 103 over H. Greenspan, et. al., "Texture Analysis via Unsupervised and Supervised Learning," IJCNN-91-Seattle International Joint Conference on Neural Networks, 1991, Vol. 1, pages 639-644 (hereinafter "Greenspan"), in this Appeal only: all claims 51-54, 57-60 and 118-120 stand or fall together.

For purposes of the rejection of claims 55, 87-90, 114, 117, 160-165, 167-170, 197-200, 224 and 227-230 under 35 U.S.C. § 103 over Greenspan in view of Kortge, in this Appeal only: claim 55 does not stand or fall with any other claim for certain arguments as separately argued in Section XIII; claims 160-162-165 and 167-170 stand or fall together for certain arguments as separately argued in Section XIII; claim 161 does not stand or fall with any other claim for certain arguments as separately argued in Section VIII; claims 87-90, 114 117 and 227 stand or fall together for certain arguments as separately argued in Section VIII; claim 87 does not stand or fall with any other claim for certain arguments as separately argued in Section VIII; claims 117 and 227 stand or fall together for certain arguments as separately argued in Section VIII; claim 224 does not stand or fall with any other claim for certain arguments as separately argued in Section VIII; claims 197-199 stand or fall together for certain arguments as separately argued in Section VIII; 228-230 stand or fall together for certain arguments as separately argued in Section VIII.

For purposes of the rejection of claim 56 under 35 U.S.C. § 103 over Greenspan as applied to claim 51 above, and further in view of Streit, in this Appeal only, claim 56 does not stand or fall with any other claim.

For purposes of the rejection of claims 115-116, 166 and 225-226 under 35 U.S.C. § 103 over Greenspan and Kortge as applied to claims 114, 160 and 224 above, and further in view of Streit, in this Appeal only: all claims 115-16, 116 and 225-226 stand or fall together.

For purposes of the rejection of claims 65-66, 69-70, 91, 94-95 and 21 under 35 U.S.C. § 103 over Greenspan in view of Dickhaus, in this Appeal only: claims 65-66, 69-70, 91 and 94-95 stand or fall together for certain arguments as separately argued in Section XVI; claims 65, 66, 69 and 70 stand or fall together for certain arguments as separately argued in Section XVI; and claims 91, 94 and 95 stand or fall together for certain arguments as separately argued in Section XVI.

For purposes of the rejection of claims 175-176, 201, 203-205 and 231 under 35 U.S.C. § 103 over Greenspan and Kortge in view of Dickhaus, in this Appeal only; claims 175-176, 201, 203-205 and 231 stand or fall together for certain arguments as separately argued in Section XVII; claims 175 and 176 stand or fall together for certain arguments as separately argued in Section XVII; claims 201, 203-205 and 231 stand or fall together for certain arguments as separately argued in Section XVII; and claims 175-176, 201 and 203-205 stand or fall together for certain arguments as separately argued in Section XVII.

For purposes of the rejection of claims 92 and 93 under 35 U.S.C. § 103 over Greenspan and Dickhaus, and further in view of U.S. Patent No. 5,337,264 (Levien), in this Appeal only, claims 92 and 93 stand or fall together.

For purposes of the rejection of claim 202 under 35 U.S.C. § 103 over Greenspan, Kortge and Dickhaus, and further in view of Levien, in this Appeal only, claim 202 does not stand or fall with any other claim.

Separate arguments have been provided for each group of claims identified above.

9. Arguments:

Introduction

The present rejections on appeal, especially in light of the prosecution history of this case, are simply outrageous. All of the pending claims have already been found to be allowable after review by six different Examiners. Then began a series of events leading to the suspicious transfer of this case, not once, but twice, to Examiners unfamiliar with the claimed technology, resulting in the entry of specious rejections, from which two appeals have now been taken.

This second appeal highlights these and other aspects of the prosecution that have not only denied Appellant the patent rights to which he obviously is entitled, but have also denied him the right to fundamental fairness in the conduct of the examination process.

Unfortunately, this is not the first time Appellant has been confronted with such hostile treatment, making it abundantly cleat that prosecution of this application has less to do with the merits of the claimed invention than with the PTO's targeting of Appellant. The following facts bear this out.

The present application was initially examined by Examiner Kanji Patel and Primary Examiner Christopher S. Kelly, who issued an Office Action on September 3, 1999 rejecting all claims solely under 35 U.S.C. § 101. No prior art rejections were made of record. To resolve the Section 101 rejection, the undersigned and Appellant attended a first personal interview with Primary Examiner Bella and Examiner Patel held on November 23, 1999. During the interview, Examiner Bella demonstrated his clear understanding of the invention, including its inherent utility and the adequacy of the disclosure. Indeed, Examiner Bella showed himself quite capable of intelligently discussing in detail the structure associated with the mathematics and flow chart underlying an embodiment of the invention and easily relating that structure to the claims, on a claim-by-claim basis. In view of these discussions, Examiner Bella agreed that the claims represented patentable subject matter and would be allowed if minor formal amendments were made to include the purpose of pattern recognition, as indicated in the Examiner's Interview Summary of November 23, 1999. The Interview

Summary also documents the fact that Examiner Bella stated that he would personally attend the Section 101 panel of three Supervisory Patent Examiners who conduct their own examination of claims containing algorithms for compliance with 35 U.S.C. § 101.

The Section 101 panel reviewed the claims and confirmed their allowability. In a subsequent telephone conversation with the undersigned, Examiner Bella reaffirmed his original determination that the claims would be in condition for allowance if minor formal amendments were made to the claims, including amending the preambles of claims 1, 27, and 33 to clarify a useful purpose. These amendments were submitted in the Amendment dated January 27, 2000 with the expectation that all claims would be allowed. To Appellant's dismay, that did not happen.

Only three weeks later, certain unfortunate events unfolded outside the procedural history of the present application that drastically changed the status of this case, resulting in the first Appeal. On February 17, 2000, Director Esther Kepplinger of Art Group 1700 improperly withdrew Applicant's unrelated application, U.S. Serial No. 09/009,294, from issuance, that was due to issue as U.S. Patent No. 6,030,601 on February 29, 2000. Appellant has good reason to believe that she took that unprecedented action--without even the slightest review of the application--in response to competitive forces outside the PTO aligned against Appellant. [See Director Kepplinger letter dated February 28, 2000 (Exhibit 2 in the first Appeal Brief dated April 3, 2001, now reinstated)] Director Kepplinger also improperly withdrew from issuance four other allowed patent applications of Appellant that were due to issue as patents. The subject matter of these withdrawn patent applications bears no relation whatsoever to the underlying artificial intelligence technology disclosed in the present application on appeal, but rather, relates to the field of quantum mechanics.

Director Kepplinger's unfounded attack on Appellant in withdrawing his allowed patent applications from issue is presently the subject of ongoing litigation, now before the U.S. Court of Appeals for the Federal Circuit (Appeal No. 00-1530). In the meantime, the PTO transferred these withdrawn applications to a Secret Committee of Examiners and Directors who have rejected all claims.

In view of this prior history, it can hardly be viewed as coincidence that, after Examiner Bella indicated allowable subject matter in this case, it was transferred without warning or explanation to Examiner Bijon Tadayon for rejection during the very same week of February 17, 2000 that Appellant's unrelated allowed applications were withdrawn from issuance. Clearly, the timing of these events demonstrates that the transfer and rejection of this case was merely an extension of the initial harassment that the PTO inflicted on Appellant in attacking his other applications and raises suspicions that motives beyond an open and honest prosecution on the merits of this case may have been a factor. Adding to this suspicion is the fact that Examiner Tadayon, in rejecting the present claims, cited references relating to quantum mechanics—the subject of Appellant's prior withdrawn applications—even though the claimed artificial intelligence invention does not relate to quantum mechanics.

These suspicions were further raised by Examiner Tadayon's statements to the undersigned and Appellant during a second interview held on June 1, 2000, following the transfer of the case. During that interview, Examiner Tadayon alleged that he took control over the present application based on his supposed expertise in the field of artificial intelligence. From the discussions held during the interview, however, it because increasingly clear that Examiner Tadayon lacked even a basic understanding of Appellant's novel usage of Fourier series in Fourier space.

Incredibly, Examiner Tadayon flatly refused to even discuss the present claims or the Section 101 and 102 rejections during the interview, and would only discuss a limited aspect of the Section 112 rejection, as reflected in the Interview Summary. Examiner Tadayon gave the following reasons for his steadfast refusals: (1) he was not the Examiner who made the Section 101 and 102 rejections; (2) he was not an expert on Section 101 rejections; and (3) he would need to confer with other Examiners in response to any questions regarding the claims and the Section 101 rejection.

Appellant respectfully submits that by wresting control of the present application away from Examiner Bella (who with clear understanding of the claimed invention indicated its allowability, as did the Section 101 panel of three senior Examiners) and giving it Examiner Tadayon (who rejected the claims despite his lacking such understanding) lends credence to Appellant's belief that the PTO is more interested in

punishing Appellant than conducting an open and honest prosecution on the merits of this case.

Since Examiner Tadayon was not the PTO official responsible for formulating the rejections in this case, as apparent from his comments, Appellant renews his previous request for a full disclosure on the record of all PTO officials and persons from outside the PTO, if any, who provided input on the March 14, 2000 Office Action, the pending Office Action, or the present application in general.

Appellant does not make this request lightly. As previously indicated, a Secret Committee of Examiners and Directors have been convened to conduct a "behind-the-scenes" prosecution of Appellant's other withdrawn applications. [See Director Kepplinger letter dated January 19, 2001 (Exhibit 3 in the first Appeal Brief dated April 3, 2001, now reinstated)] Appellant has good reason to believe that his competitors may have been involved in the withdrawal and subsequent prosecution of those applications.

These good faith beliefs are based, in part, on disturbing information that came to light regarding the activities of Appellant's competitors, who are associated with the American Physical Society (APS). Specifically, Appellant has learned from Dr. Peter Zimmerman (chief science advisor at the U.S. Department of State and member of the APS) that there is a "Deep Throat" contact in the PTO with whom Dr. Robert Park (spokesperson for the APS) has had communications regarding Appellant's pending patent applications. The PTO was made aware of this outrageous situation over one year ago in connection with the above-mentioned litigation and, to this day, has not refuted it. [See the Kepplinger letter dated January 19, 2001 (Exhibit 3 in first Appeal Brief dated April 3, 2001, now reinstated)]

Evidence linking Dr. Park and the APS to the shenanigans pulled in the present application is even more disturbing. Appellant has learned through Mr. Ivan Solotaroff, a reporter for The New York Times and Philadelphia Magazine Magazine, that Dr. Park has attacked the present application. Mr. Solotaroff conveyed to Appellant Dr. Park's statement to him that "Randy [Mills, Appellant] doesn't get it, the money is in the

Quantum Computer based on entanglement and simultaneous computation in multiple parallel dimensions [greater than four]." Mr. Solotaroff also relayed how Dr. Park boasted about blocking the present artificial intelligence patent application from being allowed because it may interfere with the Quantum Computer project endorsed by the APS and funded by the Department of Defense to the sum of over a hundred million dollars.

Appellant respectfully submits that the questionable timing of the transfer of the pending application to Examiner Tadayon, his refusal to discuss in an interview the pending claims and the Section 101 and 102 rejections of the claims, and his admission that other unnamed officials were responsible for actually preparing the Section 101 and 102 rejections are entirely consistent with the report of Dr. Park's boasting about blocking allowance of the pending application.

Moreover, the limited extent to which Examiner Tadayon was willing to discuss the Section 112 rejection during the interview and his strained arguments lend further credence to the notion that forces beyond those ordinarily encountered during the patent examination process were being brought to bear against Appellant. As detailed in the lengthy four-page Interview Summary, the Examiner was intent on manufacturing non-existent holes in the logic of Appellant's invention using strained arguments that bordered on non-sensical.

For example, Examiner Tadayon was extremely combative during the personal interview, particularly in his improper focus and misinterpretation of a mathematical formula described in the present specification instead of on the claimed invention. Unfortunately, in doing so, he failed to grasp mathematical concepts that should have been readily apparent. When the topic of discussion turned to the claimed invention and Examiner Tadayon was questioned why the detailed, yet simple-to-follow, flow charts provided in Figs. 1-21E did not comply with the requirements of Sections 101 and 112, inexplicably, he could not articulate any response.

Yet another example of Examiner Tadayon's strained arguments was his assertion during the interview that Appellant had derived a new Fourier transform operation and his insistence that Appellant provide a mathematical proof thereof. The

Examiner apparently failed to recognize that Fourier-type transforms are well known and that Appellant is simply using a novel method to parameterize data to form a novel type of Fourier series and, in a broader embodiment, Fourier series are not even required, only a parameterization of a corresponding formula. Ironically, Appellant has already gone well beyond what the patent laws and rules require by providing detailed derivations of the mathematical formulae and examples in the Sub-Appendices to the application.

Ignoring the disclosed derivations, Examiner Tadayon requested additional proof of orthoganality for Fourier series based upon his mistaken belief that a data set input to Appellant's system must have the property of orthogonality to be parameterized into a Fourier series as taught by Appellant. This argument is complete nonsense. Real world data is not necessarily orthogonal, nor does Appellant's invention require the data sets to be orthogonal. Had Examiner Tadayon made even a cursory review of the application—which apparently he did not—he would have realized that Appellant's disclosed invention does not teach Fourier transforming the input data as a waveform into a Fourier series with the requirement of orthogonal components. [See Siebert, W. McC., Circuits, Signals, and Systems, The MIT Press, Cambridge, Massachusetts, (1986), pp. 364-384, cited on page 106 of the present application (Exhibit 4 of reinstated April 3, 2001 Appeal).] In one embodiment, Appellant teaches FORMATTING the data as parameters ρ_{0_m} and $N_{m_{\rho 0}}$ of each component of a Fourier series in Fourier space. This format permits the determination of the spectral similarity of one set of data so formatted and another formatted in the same manner. In another embodiment, the data is simply formatted in terms of a specific memory structure that determines the parameterization of a formula for determination of the spectral similarity of one set of data and another. [See page 13, line 1 to page 16, line 15 and page 45, lines 3-8 of the present application.]

To his credit, Examiner Tadayon did offer an explanation during the interview for his lack of familiarity with the subject matter of the claimed invention, stating that he was

so busy teaching new Examiners that he did not have time to learn the invention. Of course, if Examiner Tadayon was too busy to properly study the application and give it proper consideration, that raises the question of why he was instructed to take over prosecution in this case.

Appellant has spent over three years prosecuting this application at considerable expense. It is simply outrageous that the PTO would subvert allowance of this case by ignoring the thorough examination conducted by three previous Examiners and the Section 101 panel of senior Examiners specializing in reviewing claims containing algorithms, and by transferring the case under suspicious circumstances to an Examiner who admittedly is not an expert in the field of artificial intelligence and was unable to articulate the bases for his rejections.

Even after Appellant brought all of the above-mentioned abuses to the PTO's attention in his Appeal Brief filed on April 3, 2001, the PTO did not respond to Appellant's concerns. Instead, it continued to harass Appellant by transferring the application to yet an <u>eighth</u> Examiner, Wenpeng Chen, for what would be the <u>fourth</u> examination of the present application.

Examiner Chen, in an attempt to explain away Examiner Tadayon's hostile prosecution of this case, makes the following excuses for his behavior:

> As explained in Specification section below, the specification can cause confusion. Because of the confusion, Claims 51-322 were rejected under 35 U.S.C. § 112, first paragraph in the previous Office Action by Examiner Tadayon under his reasonable interpretation. Examiner Tadayon has left USPTO. Continuous execution of this case was assigned to the present Examiner Winpeng Chen. [Office Action at page 2]

This statement only begs the question: What was the PTO's true motivation in initially transferring the application away from Examiner Bella—who had thoroughly examined the claims, conducted an extensive personal interview to discuss the application and fully understood the specification, and had the case reviewed by the panel of three senior Examiners—to Examiner Tadayon, who admittedly did not understand the invention?

The PTO fails to explain why this application was not returned to Examiner Bella, who understands the disclosed invention and is qualified to examine it. Rather, the PTO responds simply by transferring this application yet again, this time to Examiner Chen, who, as explained below, also admittedly did not understand the claimed invention. Appellant has already gone to considerable expense to appeal this case once in defeating the nonsensical rejections applied by Examiner Tadayon, after having received an indication of allowability by six previous Examiners. Examiner Chen has merely withdrawn Examiner Tadayon's rejections and substituted his own, even more absurd rejections resulting in this second appeal at further undue expense to Appellant.

Perhaps most disturbing is the Examiner's ignoring of the express teachings of the specification away from using neural networks, which have severe limitations. [See page 1, lines 11-25, of the present specification] Surely, the current Examiner could not have missed this negative teaching since it is only one paragraph long and makes up the entire "Background of the Invention" Section. Despite that negative teaching, all of the Examiner's prior art rejections rely primarily on references that teach neural networks. The Examiner compounds his error by rewriting these neural network references to conform with Appellant's teachings in an obvious attempt to subvert issuance of this application. Appellant's detailed arguments provided below make it abundantly clear that the presently claimed invention is far removed from neural networks and, thus, could not possibly be anticipated or made obvious thereby.

One of the few comments by Examiner Chen—whether intentional or not—that Appellant agrees with is his reference in the above-cited quote to the "[c]ontinuous execution of this case," which is an honest assessment of what has transpired in this case. The PTO, in effect, has sought the "execution" of Dr. Randell L. Mills' patent applications, including the present application, using unconventional procedures to carry out the "death sentence" by any means necessary. Examiner Chen is merely acting as yet another "executioner" willing to make ever more strained prior art, enablement, and operability rejections in an attempt to kill off Appellant's applications at all costs.

Such unfair treatment of Appellant in prosecuting his patent application constitutes an intolerable abuse of the examination process and undermines the merits of the pending rejections in this case, as discussed below.

I. The drawings fully comply with 37 CFR 1.83(a) and MPEP § 608.2(d)

In paragraph no. 3, on page 3 of the Office Action, the Examiner states his objections to the drawings:

> The drawings are objected to under 37 CFR 1.83(a) because they fail to show the details of each block as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Each block in Figures 2, 4, and 5 has to be labled. Correction is required.

A working example of recording the data from a triangle and recognizing the triangle is given in the Detailed Description of the Invention on page 6, line 25 through page 23, line 26. Each block of Figures 2, 4, and 5 is labeled with a reference number that is fully described in the Detailed Description of the Invention on page 6, line 25 through page 23, line 26 as to the function of each block according to an embodiment of the present invention. However, Appellant will amend Figs. 2, 4 and 5 to include labels upon allowance of pending claims.

The Examiner further objects to Figures 6 and 7 as not including labels for the axes shown in the figures. Appellant knows of no such requirement. The axis labels are unnecessary to practice the claimed invention since the schematic drawings are merely plots of equations. See page

Page 5, lines 14-19, of the written description describes the relevance of Figures 6 and 7 as follows:

> Figure 6 is a schematic drawing of the "P or M element response" comprised of a series of seven "impulse responses" in accordance with the invention.
>
> Figure 7 is a schematic drawing of the Fourier Transform $H(K_p,K_z)$ of the system function $H(p,z)$ corresponding to "impulse response" in accordance with invention.

Regarding Figure 6, page 26, lines 12-18 of the written description discloses:

> All layers comprise processor elements called "P elements" each with a system function response defined as the "impulse response" (Eqs. (37.22-37.24)) and an output (herein defined as the "P element response") shown in FIGURE 6 comprising a "pulse train of impulse responses"--an integer number of traveling dipole waveforms (each called an "impulse response").

Regarding Figure 7, page 55, lines 21-23 of the written description discloses:

> An "impulse response" has the system function, $h(\rho, z)$, which has the Fourier transform, $H[k_\rho, k_z]$, which is shown in FIGURE 7.

$$H[k_\rho, k_z] = \frac{4\pi k_\rho^2}{k_z^2 + k_\rho^2} = \frac{4\pi}{1 + \frac{k_z^2}{k_\rho^2}} \qquad (37.25)$$

In view of this clear written description, no axis label is required to understand the schematic drawings shown in Figs. 6 and 7 since they are merely plots of the disclosed equations.

Appellant further notes that in all prior Office Actions, none of the other seven Examiner's required axis labels. For Examiner Chen to raise this new objection at this late stage of the proceedings is improper.

For these reasons, the objections to the drawings should be withdrawn.

II. The specification complies with the patent laws and rules

In this fourth examination of the present application, the Examiner raises new objections to the present specification. Appellant respectfully submits that the present specification fully complies with all applicable patent laws and rules.

Specifically, in paragraph no. 5(a), on pages 3-4 of the Office Action, the Examiner states:

a. In the amendment file[d] on 2/9/2001, the phase factor δ_s is used in the second equation in page 5. However, how to give a value of δ_s is not disclosed. Can it be any number? Or shall it be derived from the input data? If it is the latter, the step derivation is not shown.

Original Examiner Bell and the Section 101 committee of senior Examiners had no problem reading the present specification and finding support for the phase factor. Furthermore, the phase factor was discussed at length with present Examiner Chen during the June 6, 2001 interview.

As discussed during that interview, one skilled in the art, reading and comprehending the written description, would readily understand that the parameter δ_s is a phase shift. Its role and values are clearly disclosed and can easily be implemented by such a skilled person. For example, on page 74, lines 2-9, the written description discloses:

> Thus, the "coupling cross section" given by Eq. (37.88) is a dimensionless complex number that comprises a "coupling cross section" amplitude, β_s^2, and frequency difference angle, ϕ_s, of the harmonic "coupling". In other embodiments of the present invention, further operations may be performed on such as phase shifting, normalizing to a given parameter, scaling, multiplication by a$\langle\beta_s^2(\phi_s)\rangle$ factor or parameter such as a gain factor, addition or subtraction of a given parameter or number such as an offset, etc.

The use of the phase shift is an independent adjustable parameter that can be used to enhance the operability of the present invention to achieve pattern recognition and processing as disclosed on page 74, line 2 to page 80 line 3 of the written description. See also page 80, lines 1-2 of the written description, which discloses, “the independent phase shifts, δ_s, of Eq. (37.106).”

Other relevant disclosure relating to phase shift appears on page 84, lines 10-25 of the written description:

> Also, multiple other cascades of association "stages" ("association ensembles") may act as delay-line memory actuators that produce a time

> delay, $\delta(t - t_0)$, during independent "activation" of a given "association ensemble" with recall from memory. In k, ω –space, the time delay is equivalent to a modulation of the correlation function given by Eq. (37.63) corresponding to the independent phase shifts, δ_s, of the correlation function (Eq. (37.106)) of the separate "associated" "groups of SFCs". During "string" ordering by the Matrix Method of Analysis, the independent phase shifts, δ_s, may modify the order of the Fourier series of the "string" representing information. In addition, the independent phase shifts, δ_s, may initially modify the content of the "string" by altering the correlation function (Eq. (37.106)) to cause information to be "associated" which otherwise would not likely be or inhibit the "association" of information which otherwise would be. These mechanisms further provide for information with novel conceptual content.

In paragraph No. 5(b), on pages 4-5 of the Office Action, the Examiner suggests changing the terms used to describe and define Appellant's invention. Appellant respectfully submits that the terms are well defined in the Summary of the Invention and in the Detailed Description of the Invention on page 6, line 25 through page 23, line 26. Appellant has gone even further by providing Additional Support Appendices for background, which includes derivations of the equations. Appellant has the right to be his own lexicographer and favors his own definitions of these terms over that the current Examiner would force on him.

These latest objections are but a continuation of the "cat-and-mouse" game the PTO is playing, in which each successive Examiner seeks to impose new requirements to satisfy his/her own personal preferences for certain claim terms after previous requirements have already been met. Appellant has described his claim terms with particularity and definiteness as required by Section 112 and the current Examiner has failed to show otherwise. Thus, withdrawal of the objection to the specification is respectfully requested.

III. The objections to the claims at paragraph Nos. 6 and 7, on page 6 of the Office Action, are mooted by the Amendment filed herewith

An Amendment under Rule 116 has been filed herewith to reduce the issues for appeal.

The dependency of claims 79-82 and 189-192 has been amended such that they are no longer duplicates of copending claims 71-74 and 181-184. Claims 229-236 have been amended as suggested by the Examiner to include the term "medium" after "computer-readable." Similarly, claim 240 has also been amended to include the term "medium" after "computer-readable." None of these amendments has been made to overcome prior art. No new issues or matter have been raised by these amendments.

IV. The rejection of claims 127-155, 237-265, and 294 under 35 U.S.C. § 112, second paragraph, at paragraph 9, on page 6 of the Office Action, is mooted by the amendment filed herewith

In the Amendment filed herewith, claims 127, 237 and 294 have been amended to replace the language "<u>the</u> high level memory" with "<u>a</u> high level memory" to correct the antecedant basis raised by the Examiner. None of these amendments have been made to overcome prior art. No new issues or matter have been raised.

V. Claims 61-64, 71-86, 98-113, 123-126, 138-145, 148-155, 171-174, 181-196, 208-223, 233-236, 248-255, and 258-265 fully comply with 35 U.S.C. § 112, second paragraph

In paragraph no. 10, on pages 6-7 of the Office Action, the Examiner rejected claims 61-64, 71-86, 98-113, 123-126, 138-145, 148-155, 171-174, 181-196, 208-223, 233-236, 248-255, and 258-265 under 35 U.S.C. § 112, second paragraph. All of these claims fully comply with Section 112 for the following reasons.

First, the Examiner wrongly asserts that "[b]ecause the link between 'data' and the 'parameters' are not recited, Claim 61 is incomplete." Applicant respectfully submits that claim 61 satisfies section 112, second paragraph, especially upon review of the claims in view of the specification.

In particular, independent claim 51 specifies "encoding data as parameters of a plurality of Fourier components in Fourier space" and "adding at least two of said Fourier components together to form at least one Fourier series in Fourier space...." A review of the specification establishes that the claim term "data" refers to that which is

used to generate parameters for Fourier components, and reads, for example, on the "data element at a point in time [which] may be a voltage of a particular CCD element of the CCD array." [Page 8, lines 5-6] Claim 61 further narrows the claim term "data" by specifying that "said data is representative of physical characteristics," as opposed to representations of physical characteristics. [See page 6, lines 27-30 of the present specification (stating that "information is based upon physical characteristics or representations of physical characteristics and a relationship of the physical characteristics.")]

Independent claim 51 also specifies "encoding data as parameters of a plurality of Fourier components." See page 8, lines 20-22 of the present specification, which teaches that the "Fourier transform processor 22 encodes each data element as parameters of a Fourier component in Fourier space and stores the data parameter values... ." As specified in dependent claim 61 and as disclosed at page 8, lines 26-30, the Fourier series is composed of parameters including quantized amplitude, frequency, and phase angle, constants, frequency variables, integers, and data parameters.

See page 8 line 19 to p. 9 line 9, a relationship between the data can be recorded from the physical world by transducers and the parameters of Applicant's Fourier series in Fourier space for a working example is disclosed:

> Referring to FIGURE 2, in the first step, the Input Layer 12 receives the data from the transducer (not shown). A Fourier transform processor 22 encodes each data element as parameters of a Fourier component in Fourier space and stores the data parameter values to the Input Layer section 24 of the memory 20. Each Fourier component of the Fourier series may comprise a quantized amplitude, frequency, and phase angle. For example the Fourier series in Fourier space may be:

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}N_{m_{\rho_0}}N_{m_{z_0}}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_m}}\right)\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_m}}\right)\frac{N_{m_{z_0}}z_{0_m}}{2}\right)$$

having a quantized amplitude, frequency, and phase angle, wherein a_{0_m} is a constant, k_ρ and k_z are the frequency variables, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are the data parameters.

In a first embodiment, the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component are proportional to the rate of change of the physical characteristic. Each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic. In the triangle example, the amplitude of the voltage at a given CCD element relative to the neighboring CCD element defines the rate of change of the voltage which is converted into the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$. The inverse of the amplitude of the voltage of each CCD element is converted into the data parameters ρ_{0_m} and z_{0_m}. As illustrated in FIGURE 3 and described above, for each CCD element, the Fourier series, parameterized accordingly, are stored to a specific sub register 27 of a specific register 26 of the Input Layer section 24 of the memory 20. Since the structure of a Fourier series is known in the art, only the parameters need to be stored in a digital embodiment.

The parameterization of and use of Fourier series in Fourier space in effect "compresses" the possible continuous stream of physical characteristics from the world and allows for processing with much less data.

For example on page 36, line 37 to page 37, line 6 of the present specification, this processing efficiency aspect is disclosed:

And, the number of terms necessary to represent most objects is not overwhelming. In fact, even a potentially challenging object having sharp edges such as a square pulse poses no difficulty in that is fairly accurately represented by only seven terms of a Fourier series in the time domain comprising the prior art [1]. The same principle applies to information represented as a Fourier series in $k,\omega-$space.

In addition, pages 7-8 of the present specification describe how context can be encoded by the data parameters and stored in the memory 24 in a format, enabling the data parameters to be utilized with the relevant context.

One skilled in the art would easily recognize how to build a Fourier series parameterized according to the data as disclosed wherein each Fourier component has frequency as the variable rather than time like the prior art. For example, Claim 61 recites that k_ρ and k_z are the frequency variables. The parameters derived from the data are substituted into the Fourier series formula. For example a_{0_m} is a constant, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are the data parameters as recited by Claim 61. This procedure gives the recited Fourier series in Fourier space having a quantized amplitude, frequency, and phase angle.

Applicant once again points out that seven previous Examiners found that these claims fully comply with all applicable patent laws and rules, which resulted in an initial indication of allowability.

For these and other reasons, claims 61-64, 71-86, 98-113, 123-126, 138-145, 148-155, 171-174, 181-196, 208-223, 233-236, 248-255 and 258-265 fully comply with 35 U.S.C. § 112, second paragraph. Accordingly, withdrawal of the Section 112 rejection should be withdrawn.

VI. Claims 127-155, 237-265, 294-298, and 307-322 fully comply with 35 U.S.C. § 101

At paragraph no. 12, on pages 7-11 of the pending Office Action, the Examiner rejects claims 127-155, 237-265, 294-298, and 307-322 under 35 U.S.C. § 101.

Appellant respectfully submits that all of these claims fully comply with Section 101. Original claims 1-50 were rejected under Section 101. Appellants specifically amended the claims in the Amendment dated January 27, 2000 (new claims 51-322) as suggested by the previous Examiner Bella to address and overcome the Section 101 rejection. The Section 101 panel of three senior Examiners, which specializes in

reviewing claims containing algorithms for compliance with Section 101, has already reviewed claims 51-322 and found them to be in compliance with Section 101, as stated by Examiner Bella to the undersigned.

Claims 127-155, 237-265, 294-298, and 307-322 also comply with Section 101 for the following additional reasons. 35 USC §101 limits the scope of statutory subject matter, i.e., those things that can be patented, to any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.

Two recent Federal Circuit cases address the proper focus of the Section 101 inquiry as it pertains to algorithm-related inventions. *See State Street Bank & Trust Co. v. Signature Financial Group, Inc.,* 47 USPQ 2d 1596 (Fed. Cir. 1998) and *AT&T Corp. v. Excel Comm. Inc.*, 50 USPQ 2d 1447 (Fed. Cir. 1999). As stated in *AT&T* at 1454, the proper focus is "whether the algorithm-containing invention, as a whole, produces a tangible, useful result." *State Street*, provides a slightly different standard, namely, if a claimed mathematical algorithm produces "a useful, concrete and tangible result," then the claimed algorithm is deemed to have a practical use and thus presents patentable subject matter under Section 101. *See also* MPEP § 2106(II)(A) (noting that the PTO follows the *State Street* standard).

The Federal Circuit has also made clear that the "useful, concrete and tangible result" that is required of algorithm-containing inventions is not necessarily a <u>physical result</u>. For example, in *AT&T*, the tangible, efficiency in management of investment funds satisfied the useful and concrete result requirement. 50 USPQ2d at 1452 ("In *State Street*, we held that the processing system there was patentable subject matter because the system takes data representing discrete dollar amounts through a series of mathematical calculations to determine a final share price – a useful, concrete, and tangible result."). *See also In re Lowry,* 32 USPQ 2d 1031, 1035 (Fed. Cir. 1994)

(holding that increased efficiency in computer operation is a useful, concrete and tangible result).

In accordance with this controlling precedent, all of the pending claims provide a useful, concrete and tangible result, namely, the recognition of a pattern in data and, thus, fully comply with Section 101. Indeed, previous Examiner Bella and the Section 101 panel explicitly recognized this standard when they required that the claims be amended to recite the purpose of recognizing the pattern in data, to which Appellant complied.

Certain pending claims can also be shown to define patentable subject matter under Section 101 based on the "safe-harbor" provided in the Federal Circuit's *In re Lowry* decision. According to that case, all that is required to comply with Section 101 is that a claim set forth a "data structure." 32 F.3d 1579,1584 ("Data structures are physical entities that provide increased efficiency in computer operation."). Thus, claims 307-322, which all require a "data structure in a memory for access by a computer program for processing information," fully comply with Section 101. Furthermore, claims 127-155 and 294-298 all require storing data in a memory, which is a connection to the "physical world" and thus, they too fully comply with Section 101 under this standard. Of course, as explained above, the increased efficiency of Appellant's inventive data structure further qualifies as a "useful, concrete and tangible result" in accordance with subsequent court decisions.

The Federal Circuit's decision in *In re Beauregard* establishes yet another "safe harbor" providing additional support for the utility of Appellant's claimed invention. 53 F. 3d 1583, 35 USPQ 2d 1383 (Fed. Cir. 1995). In that case, the PTO concurred with the Court that a computer program embodied in a tangible medium is statutory subject matter under Section 101. Thus, claims 237-265, which all require "a computer-readable medium," fully comply with Section 101.

On pages 10-11 of the Office Action, the Examiner states:

> The preamble phrase "for pattern recognition" is at best a field of use limitation. The Supreme Court has held that a field of use limitation cannot make a claim statutory by "attempting to limit the use of the formula to a particular technological environment. Diehr, 209 USPQ at 10 (1981). Thus, the field of use limitation fails to render the claim statutory.

Claims 127-155, 237-265, 294-298 and 307-322 do not merely recite the pattern recognition step in the preamble. As stated above, and stated in Appellant's first April 3, 2001, original Examiner Bella raised this same rejection and Appellant overcame the rejection be amending the claims to include the active step of "pattern recognition." See claims 127, 237, and 294, step (w), which recites the active step "a pattern in information has been recognized." See claim 307, last paragraph, which recites the active step of "recognition of characteristics of said newly presented information." See claim 313, last two lines, which recites the active step of "to achieve recognition of a pattern in information." Thus, the Examiner improperly ignores claim language and is trying to reintroduce a rejection that has already been overcome. For this reason alone, the Section 101 rejection should be withdrawn.

The Examiner argues on page 11 of the Office Action that "[c]laims 127-155, 237-265 and 294-298 define a computer algorithm without limitation to a practical application, such as a physical hardware computer for performing the algorithm, or specific code embodied on a computer readable medium along with the code's interaction with computer hardware for performing the algorithm, and are therefore unpatentable abstract idea." On page 8, of the Office Action, the Examiner argues that "the invention defined by claims 307-322 is a data structure per se and therefore is non-statutory. The data stored on claims 307-322 are those like music stored on a disk."

This allegation is simply not true. All of these claims require the active step of recognition of a pattern. Moreover, what is stored in claims 307-322, as well as claims 127-155, 237-265, 294-298, recognizes patterns in input data and processes the data, and what is stored may repeat these operations in a novel and distinctly different manner having so

acted on the first input data. In other words, what is stored is **not** static—it changes with use and is adaptive. Thus, contrary to the Examiner's allegation, the claimed method is clearly not the same as stored music, which is static in its recall. Instead, the claimed method is statutory since it performs pattern recognition and processing in a manner that causes physical manufacture in the computer itself. By implementation of the method, the computer acquires a distinctly different ability to further achieve pattern recognition and processing.

Contrary to the Examiner's position on page 11 of the Office Action, "object identification, voice recognition, nuclear reaction, and dictionary" are in fact practical applications. The invention described in the written specification is not limited to software and hardware that runs the software, as presently claimed. As disclosed in the Specification, the Invention further comprises an analog embodiment. The presently claimed embodiment that uses a computer is merely a simulation of the analog embodiment. The analog embodiment requires no computer; thus, the Examiner's objection is moot since an analog system for pattern recognition and processing by definition cannot be an abstract idea or merely a mathematical algorithm. For example, SUB-APPENDIX I is the derivation of the Input and the Band-Pass Filter of the Analog Fourier Processor according to the present invention. On page 24, line 32 to page 26, line 2, the Specification discloses:

> The following invention of Pattern Recognition, Learning, and Processing Methods and Systems comprises analog or digital embodiments of:
>
> 1.) an Input Layer which receives data representative of physical characteristics or representations of physical characteristics of the environment and transforms it into a Fourier series in $k,\omega-$space wherein input context is encoded in time as delays which corresponds to modulation of the Fourier series at corresponding frequencies. The derivation of the input comprising a Fourier series in $k,\omega-$space is given in SUB-APPENDIX I--The Input and the Band-Pass Filter of the Analog Fourier Processor. The derivation of the encoding of input context in time as delays which corresponds to modulation of the Fourier series at corresponding frequencies is given in SUB-APPENDIX VI--Input Context. A flow diagram of an exemplary transducer data structure of a time delay interval subdivision hierarchy is shown in FIGURE 3. The corresponding derivations are also given in SUB-APPENDIX VI;
>
> 2.) an Association Filter Layer which receives multiple Fourier series from the Input layer, and High Level Memory, and forms a series

(called a "string") of multiple Fourier series each representative of separate information by establishing "associations" between "string" member Fourier series. In $k,\omega-$space, the Fourier series are sampled and modulated via time delayed Gaussian filters called "association filters" or "association ensembles" that provide input to form the "associations". The derivation of the time delayed Gaussian filters which provide sampling and modulation (frequency shifting) of the Fourier series in $k,\omega-$space is given in SUB-APPENDIX II--Modulation and Sampling Gives the Input to the Association Mechanism and Basis of Reasoning. The derivation of the "association" of Fourier series is given SUB-APPENDIX III--Association Mechanism and Basis of Reasoning;

3.) a "String" Ordering Layer which receives the "string" as input from the Association Filter Layer and orders the information represented by the "string" as a nested set of subsets of information with a Matrix Method of Analysis Algorithm via Poissonian probability based associations with input from High Level Memory. The methods of ordering the "string" comprising associated information are given SUB-APPENDIX IV--Ordering of Associations: Matrix Method, and

4.) an Output of the Ordered "String" to High Level Memory Layer with Formation of the "Predominant Configuration" which is analogous to statistical thermodynamics and arises spontaneously because the activation of any association filter, input to the Association Filter Layer to form a "string", and the input to the "String" Ordering Layer are based on their activation history whereby activation is effected by probability operators. The derivation of the predominant configuration structure is given in SUB-APPENDIX VII--Comparison of Processing Activity to Statistical Thermodynamics/Predominant Configuration.

Also see page 37, lines 6-24 of the present specification:

The following invention of Pattern Recognition, Learning, and Processing Methods and Systems comprises analog or digital embodiments. In one embodiment, analog circuit elements store, retrieve, and process input waveforms wherein the circuit elements have the system functions or impulse responses or comprise the operators and structures which transform input to output as described herein. In another embodiment, the mathematical functions corresponding to the waveforms of any stage of storage, retrieval, or processing are represented digitally, and the digital waveforms are digitally processed in a manner equivalent to the analog embodiment according to signal processing theory such as the Nyquist theorem. In a preferred embodiment, a digitally based

> "processor" comprises simulations methods and systems according to the analog systems and processes of the present invention. The Nyquist theorem states that all of the information in any waveform can be conserved and recovered by digital processing with frequency components equal to twice the maximum frequency of any waveform [2]. Thus, the analog and digital embodiments perform equivalently.

For all of the foregoing reasons, Appellant submits that all of the pending claims 127-155, 237-265, 294-298, and 307-322 fully comply with Section 101 and the rejection should be withdrawn.

VII. Claims 157 and 266-267 are patentable under 35 U.S.C. § 102(e) over U.S. Patent No. 6,058,206 (Kortge)

At paragraph no. 14, on pages 12-13 of the Office Action, the current Examiner rejected claims 157 and 266-267 under 35 U.S.C. § 102(e) over Kortge. These claims are not anticipated by Kortge for the following reasons.

For a reference to anticipate under section 102, every limitation of the claim "must be identically shown in a single reference." In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990) (quoting Diversitech Corp. v. Centrum Steps, Inc., 850 F.2d 675, 677, 7 USPQ2d 1315, 1317 (Fed. Cir. 1988)). Kortge cannot anticipate the claimed invention since it does not identically show each claim limitation for the following reasons.

Kortge teaches using a group of noisy-OR type neural networks (50) to implement the feature detectors (28) and memory (40), and to obtain the parts by soft segmentation of the current input signal (26). Alternatively, Kortge teaches maintaining a lossless memory (40) separate from the feature detectors (28), and the parts consist of differences between the current input signals (26) and comparison patterns stored in the memory (40).

The claimed invention is very different from the neural network disclosed in Kortge. Indeed, page 1, lines 11-25, of the present specification, entitled Background of the Invention, clearly teaches away from using neural networks and discusses the severe limitations of neural networks, such as the one disclosed in Kortge:

> Background Of the Invention
>
> Attempts have been made to create pattern recognition systems using programming and hardware. The state of the art includes neural nets. Neural nets typically comprise three layers--an input layer, a hidden layer, and an output layer. The hidden layer comprises a series of nodes which serve to perform a weighted sum of the input to form the output. Output for a given input is compared to the desired output, and a back projection of the errors is carried out on the hidden layer by changing the weighting factors at each node, and the process is reiterated until a tolerable result is obtained. The strategy of neural nets is analogous to the sum of least squares algorithms. These algorithms are adaptive to provide reasonable output to variations in input, but they can not create totally unanticipated useful output or discover associations between multiple inputs and outputs. Their usefulness to create novel conceptual content is limited; thus, advances in pattern recognition systems using neural nets is limited. [Emphasis added]

Surely, the Examiner could not have missed this negative teaching since it is only one paragraph long and makes up the entire Background of the Invention Section. For this reason alone, the Section 102 rejection should be withdrawn.

Claim 266 recites the use of "ordered strings comprising Fourier series." The Examiner, however, has failed to even attempt to show how Kortge teaches the use of ordered strings comprising Fourier series. Thus, the Examiner has not met his burden of providing a prima facie case of anticipation and the burden has not shifted to Appellant to show otherwise. In any case, Kortge does not disclose the use of such ordered strings comprising Fourier series and, thus, cannot anticipate claim 266.

Claims 157 and 267 recite the use of a "probability operand." Kortge does not disclose the use of a probability operand and, thus, cannot anticipate claims 157 and 267, as further explained below.

Claim 157 recites the following steps:

a.) generating an activation probability parameter based on a prior activation probability parameter and a weighting based on an activation rate of the corresponding component;

b.) storing the activation probability parameter in memory;

c.) generating a probability operand based on the activation probability parameter;

d.) if **said probability operand is a desired value, activating any component of one or more of the group consisting of an input layer, an association layer, a string ordering layer, and a predominant configuration layer, the activation being based on the activation probability parameter**, wherein a pattern in information is recognized when said probability operand is said desired value;

e.) repeating steps a-d until a pattern is recognized in the information.

Claims 267 recites similar steps, but using a computer-readable medium. A non-limiting example of how these steps can be conducted is describe in detail on page 21, line 17 to page 22, line 33, of the present specification.

Rather than identify the actual disclosure in Kortge that identically discloses Appellant's probability operand, the Examiner improperly attributes Appellant's teaching of a probability operand and an activation based on the operand to Kortge's disclosure of a neural network in complete disregard of Appellant's specific teaching against using a neural network. On this point, column 12, lines 27-44 of Kortge teaches:

> A second way of doing recognition with such a network—which is my preferred way —is to use a separate class network 50[c] to model each class as shown in FIG. 3. At recognition time, the input is presented to each class network 50[c], and each is used to produce a likelihood value representing the probability that the network would generate the input pattern. These likelihood values are computed by the classifier 34, which receives from the class networks 50, the feature activity signal 30 as well as other information needed to compute the likelihood's, such as network weight values and activities of non-hidden units. The classifier 34, combines likelihood values (via well known Bayes Rule) with prior class probabilities, to obtain the (relative) posterior class probability

> information. From this information it computes the index of the most probable class, which it communicates via the output signal 36.

Kortge uses probability consideration to calculate which part of his network will respond to important features in an input signal, which comprises an index of the most probable class. The Examiner's allegation that "[t]he index is a probability operand" is simply false. Kortge's index is calculated by using Bayes Rule. Neither the words nor the interpretation by the Examiner that "the index is 'yes' for outputting the most probable symbol" appears in, or can be gleaned from, Kortge at column 7, lines 18-24. This is a gross distortion by the Examiner of what Kortge actually discloses:

> An effector 38 is connected to receive the output signal 36, and is configured to take action 70 in the world base on the signal 36. For example, if the system is being used to recognize handwritten characters, the effector 38 might store an ASCII representation of the most probable character into computer memory, perhaps to allow a user to send Email using a device too small for a keyword.

From the above, one of ordinary skill in the art would readily recognize that Appellant's use of a probability operand to activate specifically recited steps is entirely different from Kortge's use of "likelihood values (via well known Bayes Rule) with prior class probabilities, to obtain the (relative) posterior class probability information .... [to compute] the index of the most probable class, which it communicates via the output signal 36." [Kortge at column 12, lines 38-44.]

Furthermore, Claim 157 recites that "a pattern in information is recognized when said probability operand is said desired value." Claim 267 recites that "recognition of a pattern in information is achieved when said probability operand is said desired value." Kortge does not teach or suggest these steps and the Examiner has not met his burden of showing otherwise.

Claims 157 and 266-267 are not anticipated by Kortge for the above-stated reasons. Accordingly, withdrawal of the Section 102 rejection is respectfully requested.

VIII. Claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309, and 312-320 are patentable under 35 U.S.C. § 102(e) over U.S. patent No. 6,173,275 (Caid)

In paragraph No. 15, on pages 13-14 of the pending Office Action, the Examiner rejected claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309 and 312-320 under 35 U.S.C. § 102(e) over Caid. The invention recited in these claims is not anticipated by Caid for the following reasons.

As previously stated regarding Kortge, the claimed invention is very different from the neural network, which is disclosed in Caid and suffers from the same deficiencies. Again, page 1, lines 11-25, of the present specification, entitled Background of the Invention, which clearly teaches away from using neural networks and discusses the severe limitations of neural networks, such as Caid. Surely, the Examiner could not have missed this negative teaching since it is only one paragraph long and comprises the entire Background of the Invention Section. For this reason alone, the Section 102 rejection should be withdrawn.

Claims 271-272, 274, 276, 278, 281-283, 287, 290-298, 304-309, and 312-320 all recite the use of "Fourier series in Fourier space," in which frequency is a variable. Caid does not disclose such a use of a Fourier series in Fourier space and, thus, cannot possibly anticipate the claimed invention.

Caid discloses "a method and system for generating context vectors associated with images in an image storage and retrieval database system." [See column 2, lines 10-25 of Caid.] In contrast, claims 271-272, 274, 276, 278, 281-283, 287, 290-298, 304-309. and 312-320 all require transforming data into Fourier series in Fourier space in which frequency is a variable. A non-limiting example of how this data can be transformed into Appellant's novel Fourier series in Fourier space is described on page 8, line 19 through page 9, line 9, the present specification.

Caid further discloses a means to represent images for later retrieval by forming a vector, which is representative of attributes of the image. The vector is generated by a

wavelet transformation of the image data. The wavelet transformation to form a Fourier series is very different from that taught by Appellant. Caid prepares a Fourier series wherein x, y, z and time are the variables. In contrast, frequency is the variable in Appellant's Fourier series in Fourier space. The method of processing is entirely different between Appellant's invention and Caid since they operate in different spaces and the Fourier series are obtained by entering different procedures. Thus, the Examiner's alleged showing that Caid anticipates claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309, and 312-320 is fatally defective.

Moreover, since Caid's wavelet transformation is not in Fourier space, context in Caid's wavelet transformation cannot be encoded, as recited in Appellant's claims 271, 272, 274, 276, 278, 281-283, and 307-320 ("input context"). According to the method taught by Caid (column 5 lines 8-11), "Random high dimensional context vectors are assigned to each atom. The context vectors are assigned to each atom. The context vectors are then modified according to the spatial relationship and co-occurrence of the atoms in the images in a procedure called bootstrapping." This disclosure makes clear that Caid is very different from Appellant's claims 271, 272, 274, 276, 278, 281-283 and 307-320.

The Examiner's strained argument alleging a connection between Caid's disclosure and Appellant's claimed invention must fail. For instance, the Examiner cites "column 6 lines 42-67; the neural network has an association layer." As previously noted, Appellant teaches against the use of neural networks, as disclosed in the Background of the Invention section of the present specification.

Caid further discusses methods of reducing the size of the wavelet transformation from "10^{24} unique atoms" (column 6, line 36) to manageable number using statistical methods and neural network techniques. Caid, however, does not disclose Appellant's method of recognizing a pattern in data by using a Fourier series in Fourier space as recited in each of claims 271, 272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, and 304-306.

Other distinctions between Appellant's claimed invention and Caid have been ignored by the Examiner. For example, the complex ordered strings of associated data or patterns recited in Appellant's claims 271, 272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301,

and 304-306 have an entirely different purpose and mathematical structure than the summary vectors of Caid. Caid further fails to disclose a method of ordering information to form new information. Instead, Caid only recognizes an image for retrieval.

Once again, the Examiner makes an extraordinarily strained comparison by citing column 10, lines 9-61 of Caid and alleging that the summary vectors are complex ordered strings. The summary vectors of Caid, however, are merely "summary vectors for images" (column 10 lines 23-24) and are weighted on how often certain atoms in a image occur: "Context vector 727 is weighted 905 by the function 1/ln(N) where N is the frequency of occurrence of atom 901 in image database 106." [See column 10, lines 30-33 of Caid.] These vectors have no similarity at all to the representation of information in Appellant's strings comprising Fourier series in Fourier space that are order formatted. In Appellant's strings, the data can be inputted with context, as recited in claims 271, 272, 274, 276, 278, 281-283 and 307-320. One of ordinary skill in the art would readily understand the many differences between Caid's summary vectors and Appellant's strings. A non-limiting example of how Appellant's strings can be formed and used is described in detail on page16, line 16 to page 21, line 8 of the present specification.

The Examiner further fails to recognize that Caid teaches "The index term/image association is generally derived by humans according to experience. One or more index terms may be associated with each image." [Column 12, line 18 to column 13, line 34] Caid further teaches, "Image relevance is assessed by computing the dot product 1305 of each summary vector 913 with the query context vector 1303, and accumulating the results 1307." [Column 13, lines 15-17]. These teaching are far removed from Appellant's steps of encoding data as a Fourier series in Fourier space, making associations to form a string comprising a sum of associated Fourier series, etc., as recited in claims 271, 272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, and 304-306, as well as encoding input context as recited in claims 271, 272, 274, 278, 281-283 and 307-320.

Simply put, the feature vectors of Caid do not correspond to Appellant's ordered Fourier series. These feature vectors are not a Fourier series in Fourier space and they cannot be encoded with context, for example using time delays or Gaussian filters, as recited in Appellant's claims 271, 272, 274, 278, 281-283 and 307-320. In Appellant's invention, the

data can be received within an input context representative of the physical characteristics and encoded in time as delays corresponding to modulation of the Fourier series at corresponding frequencies. Caid's vectors do not have this feature.

The Gabor transform, referred to by the Examiner, extracts features from feature vectors in frequency and orientation space to form associations. In contrast, in present claims 271, 272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, and 304-306, information is **not** encoded in vectors with a frequency relative orientation in some abstract space based on features associated by humans with extraction of attributes using Gabor transforms to permit the forming of associations.

The Caid data structure of the parent-child relationships discussed in a tree hierarchical order is merely to reduce the number of possible combinations of atoms and **is chosen by humans or neural nets**. Caid teaches "The index term/image association is generally derived by humans according to experience. One or more index terms may be associated with each image." [Columns 12, line 18 to column 13, line 34] It is not based on the formation of associations, as in the present claims 271, 272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, and 304-306. Caid's method uses relative degrees of association determined by Caid's vector dot products. In contrast, claims 271, 272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, and 304-306 require the formation of associations of information directly from the input and further forms more complex order formatted information comprising ordered strings.

The determination of frequency of occurrence for determining feature vectors was discussed above and has nothing to do with the activation of components of the system based on activation rate as disclosed on page 21, line 18 to page 22, line 33 of Caid.

All the Examiner has done in asserting anticipation is to copy Appellant's claims and attempted to match unrelated excerpts from Caid's neural network. Such an approach does not satisfy the requirements of anticipation. Rather, the juxtaposition of Caid and Appellant's invention merely highlights the differences—indeed inconsistencies—between the approaches and, thus, the bankruptcy of the Examiner's position.

Claims 271, 272, 274, 276, 278, 281-283, 285-288, 290, 291, 299-301, 307-309, 312, and 318-320 are also not anticipated by Caid since each of the these claims recites the step of generating a probability operand, which is not disclosed in Caid or even discussed by the Eaxminer. Thus, the Examiner has not even met his burden of showing how Caid anticipates these claims.

For the many reasons provided above, claims 271-272, 274, 276, 278, 281-283, 285-288, 290-291, 299-301, 304-309, and 312-320 are not anticipated by Caid. Accordingly, withdrawal of the Section 102 rejection is respectfully requested.

IX. Claims 158-159 and 268-269 are patentable under 35 U.S.C. § 103(a) over Kortge as applied to claims 157 and 267 above, and further in view of U.S. patent No. 5,724,487 (Streit)

In paragraph no. 17, on page 15 of the Office Action, the Examiner rejected claims 158-159 and 268-269 under 35 U.S.C. § 103(a) over Kortge as applied to claims 157 and 267 above, and further in view of Streit. These claims are not obvious over the combination of Kortge and Streit for the following reasons.

Kortge relates to neural networks, as discussed above in Section VII. Streit also relates to neural networks. Streit teaches "a multi-layer neural network which facilitates the ready interpretation of the architectural and design features of the neural network." [See column 3, lines 15-52.] Streit has only cited by the Examiner for the teaching of using "1" and "O". [See page 15 of the Office Action.]

As discussed above in reference to claims 157 and 267 in Section VII, the neural network of Kortge is very different from the claimed invention and, thus, cannot possibly teach or suggest the claimed invention on any level. Indeed, see page 1, lines 11-25, of the present specification, which clearly teaches away from using neural networks and discusses the severe limitations of neural networks, such as Kortge and Streit. Surely, the Examiner could not have missed this negative teaching since it is only one paragraph long and makes

up the entire "Background of the Invention" Section. For this reason alone, the Section 103 rejection should be withdrawn.

Kortge does not anticipate, teach, or suggest parent claims 157 and 267 for the many reasons provided Section VII. Streit does not overcome the many deficiencies of Kortge. Streit has only been cited to show a "0" and "1." Thus, dependent claims 158-159 and 268-269 also cannot be obvious from Kortge and Streit. For example, Claims 158-159 and 268-269 recite the use of a "probability operand" to activate the Applicant's pattern recognition invention, since they depend upon claims 157 and 267 respectively. Kortge does not teach or suggest the use of a probability operand for the many reasons provided in reference to claims 157 and 267 discussed herein above in Section VII. Streit also does not disclose the use of a probability operand. Thus, the combination of Kortge and Streit cannot make obvious claims 158-159 and 268-269. For these reasons, the rejection of claims 158-159 and 268-269 should be withdrawn.

X. Claims 279-280, 289, 292-293, 302-303 and 321-322 are patentable under 35 U.S.C. § 103 over Caid as applied to claims 271, 281, 291, 299 and 320 above, and further in view of Streit.

In paragraph no. 18, on page 16 of the pending Office Action, the Examiner rejected Claims 279-280, 289, 292-293, 302-303 and 321-322 under 35 U.S.C. § 103 over Caid as applied to claims 271, 281, 291, 299 and 320 above, and further in view of Streit. Appellant respectfully submits that these claims are not obvious over Caid in view of Streit.

As discussed above, Caid and Streit both relate to the use of neural networks. Neural networks operate very differently than the claimed invention. Indeed, see page 1, lines 11-25, of the present specification, which clearly teaches away from using neural networks and discusses the severe limitations of neural networks, such as Caid and Streit. Surely, the Examiner could not have missed this negative teaching since it is only one paragraph long and makes up the entire "Background of the Invention" Section. For this reason alone, the Section 103 rejection should be withdrawn.

Even if the reference were combined, the combination would not make claims 279-280, 289, 292-293, 302-303 and 321-322 obvious for the following reasons. These claims all recite the use of "Fourier series in Fourier space." Caid does not disclose the use of a Fourier series in Fourier space for the many reasons provided above in Section VIII. Sreit also does not teach the use of a Fourier series in Fourier space. Thus, the combination of Caid and Streit cannot render these claims obvious.

The complex ordered strings recited in Appellant's claims 279-280, 289, 292-293, and 302-303 have an entirely different purpose and mathematical structure than the vectors of Caid, as is fully discussed in Section VIII. Streit does not provide these deficiencies of Caid. Thus, the combination of Caid and Streit cannot make obvious claims 279-280, 289, 292-293, and 302-303.

Claims 279-280, 289, 292-293, 302-303, and 321-322 are also not obvious over Caid and Streit since each of the these claims recites the step of generating a probability operand, which is not disclosed in Caid and Streit, alone or in combination.

For the many reasons provided above, claims 279, 280, 289, 292-293, 302-303 and 321-322 are not taught or suggested by the combination of Caid and Streit. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XI. Claims 156, 270, 273, 275, and 284 are patentable under 35 U.S.C. § 103 over Caid in view of Dickhaus et al., "Classifying Biosignals with Wavelet Networks," IEEE Engineering in Medicine and Biology, September/October, 1996, pages 103-111 (hereinafter "Dickhaus").

In paragraph no. 19, on pages 16-18 of the pending Office Action, the Examiner rejected claims 156, 270, 273, 275 and 284 under 35 U.S.C. § 103 over Caid in view of Dickhaus. These claims are not obvious over the combination of Caid and Dickhaus for the following reasons.

Claims 156, 270, 273, 275, and 284 all recite the use of a Fourier series in Fourier space. Caid does not teach or suggest using a Fourier series in Fourier space for the many

reasons provided above in Section VIII. Dickhaus also does not teach or suggest using a Fourier series in Fourier space. Thus, the combination of Caid and Dickhaus cannot possibly render these claims obvious. For this reason alone, the Section 103 rejection should be withdrawn.

The combination of Caid and Dickhaus also does not make obvious claims 156, 270, 273, 275 and 284 since each of these claims utilize "input context."

Dickhaus teaches a similar approach to that of Caid involving formation of feature vectors from wavelet transformation of the input. On page 103, Dickhaus discloses that "Statistical pattern recognition uses measurements and transforms of the pattern structure as feature vectors. Feature selection is often performed by sequential approaches, or sometimes more or less intuitively by the experience of experts."

Again the Examiner inserts the words "input context" in citing of the disclosure of Dickhaus when, in fact this is not taught or even suggested. According to Dickhaus, the signal as a function of time is transformed as a wavelet series. It is not a Fourier Series in Fourier space. Appellant's input context is not taught or inferred in any way.

A non-limiting example of Appellant's input context is based on the identity of the detector, the corresponding data as a function of time mapping to specific corresponding memory locations, and according to the data encoded as a Fourier Series in Fourier space, which is modulated at the corresponding frequencies. In contrast, in the case of a wavelet transform according to Dickhaus and Caid, the shift in time corresponds to a modulation of trigonometric function of time, which does <u>not</u> encode time context or input context, as discussed fully in Section VIII of this Appeal Brief. Neither Dickhaus or Caid teach such a means to encode context. Rather, in both of Dickhaus and Caid, context is selected in atoms of the feature vectors by experts, who are humans.

For these reasons, claims 156, 270, 273, 275, and 284 cannot be obvious from the combination of Cain and Dickhaus. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XII. Claims 51-54, 57-60, and 118-120 are patentable under 35 U.S.C. § 103 over H. Greenspan, et al., "Texture Analysis via Unsupervised and Supervised Learning," IJCNN-91-Seattle International Joint Conference on Neural Networks, 1991, Vol. 1, pages 639-644 (hereinafter "Greenspan")

In paragraph no. 20, on pages 18-22 of the present Office Action, the Examiner rejected claims 51-54, 57-60, and 118-120 under 35 U.S.C. § 103 over Greenspan. These claims are not obvious from Greenspan for the following reasons.

Page 1, lines 11-25, of the present specification, entitled Background of the Invention, very clearly teaches away from using neural networks and discusses the severe limitations of neural networks, such as Greenspan. Greenspan teaches neural networks and rule-based systems. The disclosure of Greenspan is the same approach as that of Caid discussed above and with further disclosure of Gabor transforms. Surely, the Examiner could not have missed Appellant's negative teaching since it is only one paragraph long and makes up the entire "Background of the Invention" Section in the present specification. For this reason alone, the Section 103 rejection should be withdrawn.

Claims 51-54, 57-60, and 118-120 recite the use of Fourier series in Fourier space. Greenspan does not teach or suggest the use of Fourier series in Fourier space. For this reason alone, the Section103 rejection should be withdrawn.

Each of claims 51-54 and 57-60 recite the use of filters, "sampling at least one of said Fourier series in Fourier space with a filter to form a sampled Fourier series" and "modulating said sampled Fourier series in Fourier space with said filter to form a modulated Fourier series." Claims 118-120 also recites the use of filters, "forming associations between at least two of the Fourier series by modulating and sampling the Fourier series with filters." Greenspan does not teach or suggest such steps utilizing filters.

The Gabor transforms taught by Greenspan comprise time modulated and frequency shifted filters. In contrast, the filters of Appellant modulate the Fourier series in Fourier space. A non-limiting example of Appellant's filters is a delayed Gaussian filter comprising a time delayed filter, which modulates the Fourier series in Fourier

space. Non-limiting examples of how to use the filters are disclosed on page 2, lines 15-33 and page 13, line 1 to page 16, line 15 of the present specification.

The Gabor transform disclosed in Greenspan extracts features from feature vectors in the frequency and orientation space to form associations. In the present invention, information is not encoded in vectors with a frequency and relative orientation in some abstract space based on features associated by experts with extraction of attributes using Gabor transforms to permit the forming of image retrieval or associations.

The disclosure of feature vectors formed from wavelet transforms and using Gabor transforms as filters to extract feature information in an attempt to form associations is very different from the invention of Appellant. The Examiner's copying of Appellant's claims and inserting excerpts from Greenspan does not change this. It merely shows how strained the connection is when the Examiner attempts to juxtapose or mingle the two inventions.

The feature vector of Greenspan, like Caid's, is not an ordered Fourier series. It is also not a Fourier series in frequency or Fourier space. As recited in claims 57 and 58, the data can be received within an input context representative of the physical characteristics that is encoded in time as delays corresponding to modulation of the Fourier series at corresponding frequencies. Greenspan's, like Caid's, vectors do not have this feature and input context cannot be encoded. The representation of Greenspan and Caid are vectors and recognition of an image depends on the relative orientations of the vectors of all images to be associated. The Fourier series in Fourier space according to Appellant's invention is not a vector like Greenspan.

In addition, on page 19 of the Office Action, the Examiner confuses the filtering function of the Gabor transform to extract features of the feature vector with encoding context according to modulation of a Fourier series in Fourier space corresponding to a time delayed Gaussian. While none of claims 51-54, 57-60, and 118-120 is limited to the use of a Gaussian filter, it is an example of a suitable filter that can be used to determine spectral similarities and to order format the information in a string, as well as to encode context. The use of a Gaussian filter, or other filters to determine spectral similarity, is not taught or suggested by Greenspan.

Contrary to the Examiner's position, the supervised and unsupervised learning sections of Greenspan do not teach determining a spectral similarity between the modulated Fourier series and another Fourier series. Simply put, Appellant's Fourier series in Fourier space is not taught, modulating the Fourier series is not taught, and determining the spectral similarity is not taught in Greenspan.

Paragraph 5 of section 3 of Greenspan, referred to the by Examiner, states:

> In the presented simulations, each dimension of the N-dimensional attribute vector, is individually clustered. All samples are thus projected onto each axis of the space and one-dimensional clusters are found. The output of this preprocessing stage is an N-dimensional quantized vector of attributes which is the result of concatenating the discrete valued codewords of the individual codewords of the individual dimensions. Each dimension can be seen to contribute a probabilistic differentiation onto the different classes via the clusters found. As some of the dimensions are more representative than others, it is the goal of the supervised leaning stage to find the most informative dimensions for the desired task (with the higher differentiation capability) and to label the combined clustered domain.

Thus, "each dimension" is extracted from "attribute vectors" and clustered as "the result of concatenating the discrete valued codewords of the individual dimensions." Surely, the Examiner can appreciate that the steps of Appellant's invention are not taught or suggested by this disclosure of Greenspan, since they are so very different. Even the title of this section "Vector Quantization via Unsupervised Learning" should permit the Examiner to appreciate the distinction. As given in paragraph 4, of Greenspan, "The vector-quantization learning algorithm defines a mapping from an N-dimensional input vector, X, to an M-dimensional output vector Y," which is very different from claims 51-54, 57-60 and 118-120.

None of the attributes of claims 51-54, 57-60 and 118-120 are taught or suggested by Greenspan. The Examiner's inferences are completely erroneous. It is impossible to insert the features or mathematical structures of Appellant's invention, for example, such as Fourier series in Fourier space, filtering, determining the spectral similarity, and determining a

probability expectation value, into the neural network system taught by Greenspan. The converse also holds.

Furthermore, in Section 4 entitled "Supervised Learning via a Rule-Based System," Greenspan involves utilizing information in feature maps for input labeling and classification:

> In particular we need to learn a classifier which maps the output features of the Kohonen stage to the texture labels. Any classification scheme could be used. However, we utilize a rule—based information theoretic approach which is an extension of a first order Bayesian classifier, because of its ability to output probability estimates for the output classes [1].The classifier defines correlations between input features and output classes as probabilistic rules of the form: If $Y = y$ then $X = x$ with prob. P. A data driven supervised learning approach utilizes an information theoretic measure to learn the most informative links or rules between features and class labels [2]. The classifier then uses these links to provide an estimate of the probability of a given output class being true. When presented with a new input evidence vector, a set of rules R can be considered to "fire." The classifier estimates the posterior probability of each class given the rules that fire in the form $log(p(x)/R)$, and the largest estimate is chosen as the class label decision. In addition, the actual class probability could be used for further higher level processing."

The present invention does not relate to "vector quantization", "codewords", "mapping", "probabilistic rules of the form: If $Y = y$ then $X = x$ with prob. P.", "the probability of a given output class being true", "posterior probability of each class given the rules that fire in the form $log(p(x)/R)$, and the largest estimate is chosen as the class label decision", etc. The disclosure of Greenspan and Appellant's claimed invention teach systems that operates under entirely different mathematical structures and principles.

For these many reasons, claims 51-54, 57-60, and 118-120 cannot be obvious from Greenspan. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XIII. Claims 55, 87-90, 114, 117, 160-165, 167-170, 197-200, 224, and 227-230 are patentable under 35 U.S.C. § 103 over Greenspan in view of Kortge.

In paragraph no. 21, on pages 22-24 of the pending Office Action, the Examiner rejected claims 55, 87-90, 114, 117, 160-165, 167-170, 197-200, 224, and 227-230 under 35 U.S.C. § 103 over Greenspan in view of Kortge. The claimed invention is not taught or suggested by Greenspan and Kortge for the following reasons.

As stated numerous times previously, page 1, lines 11-25, of the present specification, entitled "Background of the Invention," very clearly teaches away from using neural networks and discusses the severe limitations of neural networks, such as Greenspan and Kortge. Both Greenspan and Kortge teach neural networks and rule-based systems. The disclosure of Greenspan is the same approach as that of Kortge discussed above and with further disclosure of Gabor transforms. Surely, the Examiner could not have missed Appellant's negative teaching since it is only one paragraph long and makes up the entire "Background of the Invention" Section. For this reason alone, the Section 103 rejection should be withdrawn.

The Examiner argues that Greenspan teaches the parental claim 51. This simply is not true, as discussed fully above in Section XII. Kortge does not cure the many deficiencies of Greenspan, since it also teaches a neural network. For this reason alone, the Section 103 rejection of all of these claims should be withdrawn.

Moreover, claim 51 is not the parent claim for claims 160-165, 167-170, 197-200, 224, and 227-230. Thus, the Examiner has not met his burden of showing a prima facie case of obviousness. For this reason alone, the Section 103 rejection of these claims should be withdrawn.

On page 23 of the Office Action, the Examiner merely lists the steps in Appellant's claim 55 and states that Kortge teaches them. The Examiner's insertion in Appellant's claim of "b) and the steps taught by Greenspan until a pattern is recognized" makes no sense and does not constitute a prima facie case of obviousness. For this reason alone, the Section 103 rejection of claim 55 should be withdrawn.

Regarding claim 55, the Examiner admits that Greenspan does not teach a transducer. The Examiner cites Kortge as teaching a transducer, relying upon the teaching at column 11 lines 59-68 of Kortge, regarding the firing of a "neuron" of a neural network if another "neuron" fires. This rejection, like the others, is totally misplaced. Appellant's invention is not a neural network. In Appellant's invention, for example, another Fourier series is recalled. In contrast, in Kortge and Greenspan, another "neuron" of a neural net is activated. There simply is no connection between firing a neuron and recalling a Fourier series. For this reason alone, the Section 103 rejection should be withdrawn.

Regarding claims 160, 162-165 and 167-170, the Examiner merely states that these claims correspond to method claims 51-54 and 57-60 discussed above, and he admits that Greenspan does not teach a computer-readable medium. The Examiner combines Kortge as teaching a computer-readable medium. First, claim 165 corresponds with claim 55, was not cited by the Examiner. Claims 51-54 and 57-60, which were cited, are not obvious over Greenspan for the many reasons provided in Section XII. Kortge, which is only cited for an alleged teaching of a computer-readable medium, does not cure the many deficiencies of Greenspan. For this reason alone, the Section 103 rejection of these claims should be withdrawn.

The Examiner argues that Kortge teaches the transducer of claim 161. However, Kortge teaches using a transducer in a neural network. Kortge does not teach or suggest using a transducer according to present claim 161.

The Examiner alleges that Kortge teaches two transducers since it teaches two photocells. The Examiner also argues that Kortge teaches recalling any part of the transducer string causing additional Fourier series to be recalled. [See column 11, lines 59-68.] From this, the Examiner merely concludes that claims 87-90, 114, 117 and 227 are obvious. For the many reasons provided in Section XII, Greenspan does not teach the Fourier series in Fourier space, where frequency is a variable. Kortge also does not teach or suggest this claimed feature. Thus, these claims cannot possibly be obvious over the combination of Greenspan and Kortge.

Furthermore, the Examiner has not shown how the combination of references teaches the specific Fourier space recited in claim 87. Moreovever, the Examiner has not shown how

Greenspan and Kortge teach how the probability expectation value increases according to claim 117 and 227. For these reasons alone the Examiner has not met his burden of providing a prima facie case of obviousness and the Section 103 rejection of these claims should be withdrawn.

The Examiner argues that claim 224 is obvious for the same reasons with regard to claim 157. Appellant assumes that the Examiner is referring to the Section 102 rejection of claim 157 based on Kortge in Section VII. For the many reasons provided in Section VII, Kortge does not teach or suggest claim 224. Greenspan does not cure the many deficiencies of Kortge. For the many reasons stated hereinabove, neither of Greenspan and Kortge teaches generating an activation probability operand, activating the specific layers recited in claim 157, and repeating the steps until a pattern is recognized. For these reasons, the Section 103 rejection of claim 224 should be withdrawn.

The Examiner merely states that claims 197-199 are rejected for the same reason claims 87-89 are rejected, without providing any further reasoning. Claims 197-199 are not obvious for the same reasons claims 87-89 are not obvious, as discussed above in this Section.

The Examiner alleges that claims 228-230 are rejected for the same reasons as claims 118-120, without providing any further reasoning. Claims 118-120 are not obvious from Greenspan for the many reasons provided in Section XII and, thus, claims 228-230 cannot be obvious thereover. Kortge does not cover the many deficiencies of Greenspan. Neither of Greenspan and Kortge teaches or suggest to use a Fourier series in Fourier space. For these reasons, the Section 103 rejection over claims 228-230 should be withdrawn.

For these many reasons, claims 55, 87-90, 114, 117, 160-165, 167-170, 197-200, 224 and 227-230 are not taught or suggested by the combination of Kortge and Greenspan. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XIV. Claim 56 is patentable under 35 U.S.C. § 103 over Greenspan as applied to claim 51 above, and further in view of Streit.

In paragraph no. 22, on pages 24-25 of the pending Office Action, the Examiner rejected claim 56 under 35 U.S.C. § 103 over Greenspan as applied to claim 51 above, and further in view of Streit. The claimed invention is not taught or suggested by Greenspan and Streit for the following reasons.

Claim 56 is not obvious from Greenspan for the same reasons claim 51 is not obvious, as discussed above in Section XII. Streit does not supply the many deficiencies of Greenspan. Streit is only cited for the alleged use of "0" and "1." The combination of references does not teach using a Fourier series in Fourier space, in which frequency is a variable. Furthermore, the combination of Geenspan and Streit teaches using a neural network since both Greenspan and Streit use neural networks, which is contrary to the invention recited in claim 56. See page 1, lines 11-25 of the present specification, which clearly teaches against using a neural network. As pointed out in great detail above, neural networks are very different from the claimed invention and, thus, could not possibly make obvious the claimed invention.

For the many reasons provided above, claim 56 is not obvious from the combination of Greenspan and Streit. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XV. Claims 115-116, 166, and 225-226 are patentable under 35 U.S.C. § 103 over Greenspan and Kortge as applied to claims 114, 160, and 224 above, and further in view of Streit.

In paragraph no. 23, on pages 25-26 of the pending Office Action, the Examiner rejected claims 115-116, 166, and 225-226 under 35 U.S.C. § 103 over Greenspan and Kortge as applied to claims 114, 160, and 224 above, and further in view of Streit.

These claims are not taught or suggested by Greenspan, Kortge and Streit for the following reasons.

Claims 115, 116, 166, 225, and 226 are not obvious from Greenspan and Kortge for the same reasons as claims 114, 160, and 224 are not obvious from this combination of references, as discussed above in Section XIII. Streit does not cure the many deficiencies of Greenspan and Kortge. Streit is only cited for the alleged use of "0" and "1." The combination of Geenspan, Kortge and Streit teaches to use a neural network since all three references teach to use neural networks, which is in a direction opposed to the invention recited in claims 115, 116, 166, 225, and 226. See page 1, lines 11-25 of the present specification, which clearly teaches against using a neural network. As pointed out in great detail above, neural networks are very different from the claimed invention and, thus, could not possibly make obvious the claimed invention as recited in claims 115, 116, 166, 225, and 226.

For the many reasons provided above, claims 115, 116, 166, 225 and 226 are not obvious from the combination of Greenspan, Kortge and Streit. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XVI. Claims 65-66, 69-70, 91, 94-95, and 21 are patentable under 35 U.S.C. § 103 over Greenspan in view of Dickhaus.

In paragraph no. 24, on pages 26-27 of the pending Office Action, the Examiner rejected claims 65-66, 69-70, 91, 94-95 and 21 under 35 U.S.C. § 103 over Greenspan in view of Dickhaus. These claims are not taught or suggested by Greenspan and Dickhaus for the following reasons. As an initial matter, Appellant notes that claim 21 is not pending and, therefore, is not addressed.

Regarding the remaining claims subject claims, Greenspan and Dickhaus both elate to neural networks. See page 1, lines 11-25 of the present specification, which clearly teaches against using a neural network. As pointed out in great detail above,

neural networks are very different from the claimed invention and, thus, could not possibly make obvious the claimed invention.

The Examiner argues that Greenspan teaches the parental claims 51, 57 and 118. This simply is not true. Greeenspan does not teach or suggest claims 51, 57 and 118 for the many reasons provided in Section XII above and, thus, cannot teach or suggest claims 65-66, 69-70, 91, and 94-95. Dickhaus does not cure the many deficiencies of Greenspan.

The Examiner admits that Greenspan does not disclose that the input context is encoded in time delays corresponding to modulation of the Fourier series at corresponding frequencies. Dickhaus also does not teach Appellant's encoding context as modulation of the Fourier series in Fourier space at specific frequencies as discussed fully in Section XI of this Appeal Brief. Thus, the combination of references cannot teach or suggest the "input context" of claims 65, 66, 69 and 70.

The Examiner reconstructs parts of Appellant's invention by asserting features that are not taught in the cited references and makes no sense. For example, Greenspan teaches the use of Gabor transforms as filters to extracts feature from feature vectors—not to encode context. The Examiner takes the function of Greenspan and alters it to resemble that of Appellant's invention. Greenspan teaches that the Gabor function, which operates on feature vectors consisting of prior art type **Fourier spectra of the data,** which are modulated in time and shifted in frequency; thus, Gabor states explicitly an intent that does not read on Appellant's encoding step, which relates to a space or time shift of the **data (not the Fourier spectra of the data)** may be encoded as a corresponding memory format corresponding to the modulation of a Fourier series in Fourier space. In addition, the feature vector is based on wavelets which are time based function—not frequency based as taught by Appellant.

The Examiner argues that Dickhaus teaches the use of a delayed Gaussian filter in the same manner as Appellant. This simply is not true. Dickhaus does not teach a time delayed Gaussian filter to encode context according to claims 91, 94 and 95, as alleged by the Examiner. The wavelets of Dickhaus are time functions; whereas, in claims 91, 94 and 95 the functions encoded with context by modulation at specific frequencies are Fourier series in Fourier space.

In addition, the Examiner confuses the filtering function of the Gabor transform to extract features of the feature vector with encoding context according to modulation of a Fourier series in Fourier space corresponding to a time delayed Gaussian. Claims 91, 94 and 95 utilize a Gaussian filter in a step to determine spectral similarities and to order format the information in a string as well as to encode context. None of theses uses are taught or suggested by Greenspan and Dickhaus.

For these many reasons, claims 65-66, 69-70, 91, and 94-95 are not obvious over the combination of Greenspan and Dickhaus. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XVII. Claims 175-176, 201, 203-205 and 231 are patentable under 35 U.S.C. § 103 over Greenspan and Kortge in view of Dickhaus.

In paragraph no. 25, on pages 28-29 of the pending Office Action, the Examiner rejected claims 175-176, 201, 203-205 and 231 under 35 U.S.C. § 103 over Greenspan and Kortge in view of Dickhaus. These claims are not taught or suggested by Greenspan and Kortge in view of Dickhaus for the following reasons.

The Examiner argues that parent claims 167, 160, and 228 are taught by Greenspan and Kortge. This simply is not true, as shown by the arguments presented in Section XIII hereinabove. Dickhaus does not cure the many deficiencies of Greenspan and Kortge. As discussed above in Section XVI, Dickhaus does not teach or suggest that the input context is encoded in time as delays corresponding to modulation of the Fourier series at corresponding frequencies.

In particular, claims 175 and 176 recite, "encoding said input context as a characteristic time delay which corresponds to a characteristic modulation of said Fourier components or Fourier series at a frequency within a band." This step is simply nowhere to be found in Dickhaus.

Claims 201, 203-205 and 231 relate to the use of a Gaussian filter. For the many reasons provided in Section XVI, Dickhaus does not teach using a Gaussian filter in a step to determine spectral similarities and to order format the information in a string, as well as to encode context according to claims 201, 203-205 and 231.

Once more, all three references relate to neural networks. See page 1, lines 11-25 of the present specification, which clearly teaches against using a neural network. As pointed out in great detail above, neural networks are very different from the claimed invention and, thus, could not possibly make obvious the claimed invention.

The combination of references discloses an entirely different approach:

1.) vector (prior art) versus Fourier series (claims 175-176, 201, 203-205, and 231);
2.) Fourier transforms in the form of wavelets which are incorporated into the feature vectors (prior art) versus Fourier series in Fourier space (claims 175-176, 201, 203-205 and 231);
3.) the formation of associations based on relative orientation of the vectors (prior art) versus spectral similarity (claims 175-176, 201, and 203-205);
4.) weighting based on human chosen features with possibly extraction of features with Gabor transforms (prior art) versus spectral similarity (claims 175-176, 201, and 203-205);
5.) Gabor transforms with time modulation corresponding to shifts in frequency space (prior art) versus time delayed Gaussian filters with time delay corresponding to modulation in frequency space (claims 201, 203-205, and 231); and
6.) no encoding of context except as atoms of feature vector that are selected by humans (prior art) versus encoding input context (claims 175, 176, and 203-205).

The Examiner confuses the filtering function of the Gabor transform to extract features of the feature vector with encoding context according to modulation of a Fourier series in Fourier space corresponding to a time delayed Gaussian. Claims 175, 176, 201 and 203-205 utilize a filter in a step to determine spectral similarities and to order format the information in a string as well as to encode context. Claims 201, 203-205 and 231 utilize a

time delayed Gaussian filter. None of theses uses are taught or suggested by the combination of Kortge, Greenspan and Dickhaus.

For these many reasons, claims 175-176, 201, 203-205 and 231 are not obvious over the combination of Kortge, Greenspan and Dickhaus. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XVIII. Claims 92-93 are patentable under 35 U.S.C. § 103 over Greenspan and Dickhaus, and further in view of U.S. Patent No. 5,337,264 (Levien).

In paragraph no. 26, on page 29 of the Office Action, the Examiner rejected claims 92-93 under 35 U.S.C. § 103 over Greenspan and Dickhaus, and further in view of Levien. These claims are not taught or suggested by Greenspan, Dickhaus and Levien for the following reasons.

Greenspan and Dickhaus relate to neural networks. See page 1, lines 11-25 of the present specification which clearly teaches against using a neural network. As pointed out in great detail above, neural networks are very different from the claimed invention and, thus, could not possibly make obvious the claimed invention.

The Examiner argues that the combination of Greenspan and Dickhaus teaches parental claim 91. This simply is not true. See Section XVI for a discussion of the many differences between claim 91 and the combination of Greenspan and Dickhaus. Levien does not overcome the many deficiencies of Grenspan and Dickhaus. Levein merely teaches an analog filter.

In addition, the Examiner confuses the filtering function of the Gabor transform to extract features of the feature vector with encoding context according to modulation of a Fourier series in Fourier space corresponding to a time delayed Gaussian. Claims 92-93 use a time delayed Gaussian filter in a step to determine spectral similarities and to order format the information in a string as well as to encode context. None of theses uses are taught or suggested by Greenspan, Dickhaus, and Levien.

From reading the Office Action, it becomes very clear that the Examiner ignored the negative teaching in the "Background of the Invention" Section, and merely used Appellant's claims as a blueprint in attempting to reconstruct his invention from completely unrelated elements. Even with these unrelated elements, however, the Examiner does not even come close to reconstructing Appellant's invention. No combination of references teaches Appellant's invention.

For these many reasons, claims 92-93 are not obvious over Greenspan, Dickhaus and Levien. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

XIX. Claim 202 is patentable under 35 U.S.C. § 103 over Greenspan, Kortge and Dickhaus, and further in view of Levien.

In paragraph no. 27, on pages 29-30 of the pending Office Action, the Examiner rejected claim 202 under 35 U.S.C. § 103 over Greenspan, Kortge, and Dickhaus, and further in view of Levien. These claims are not taught or suggested by Greenspan, Kortge, Dickhaus, and Levien for the following reasons.

Greenspan, Kortge, and Dickhaus relate to neural networks. See page 1, lines 11-25 of the present specification which clearly teaches against using a neural network. As pointed out in great detail above, neural networks are very different from the claimed invention and, thus, could not possibly make obvious the claimed invention.

The Examiner argues that the combination of Greenspan, Kortge, and Dickhaus teaches parental claim 201. This simply is not true. See Section XVII for a discussion of the many differences between claim 201 and the combination of Greenspan, Kortge, and Dickhaus. Levien does not overcome the many deficiencies of Grenspan, Kortge, and Dickhaus. Levein merely teaches an analog filter.

In addition, the Examiner confuses the filtering function of the Gabor transform to extract features of the feature vector with encoding context according to modulation of a Fourier series in Fourier space corresponding to a time delayed Gaussian. Claim 202 uses a

time delayed Gaussian filter in a step to determine spectral similarities and to order format the information in a string as well as to encode context. None of theses uses are taught or suggested by Greenspan, Dickhaus, and Levien.

For these many reasons, claims 202 is not obvious over Greenspan, Kortge, Dickhaus and Levien. Accordingly, withdrawal of the Section 103 rejection is respectfully requested.

Conclusion

In view of the arguments presented hereinabove, all of the pending claims 51-322 fully comply with 25 U.S.C. §§ 101, 112 and 102 and 35 U.S.C. § 103. Accordingly, Appellant respectfully requests that the Board withdraw the Examiner's rejections of claims 51-322 and allow all claims.

Respectfully submitted,

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